AIP | Journal of Physical and Chemical Reference Data

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Citation: Journal of Physical and Chemical Reference Data **43**, 023102 (2014); doi: 10.1063/1.4869683
View online: http://dx.doi.org/10.1063/1.4869683
View Table of Contents: http://scitation.aip.org/content/aip/journal/jpcrd/43/2?ver=pdfcov
Published by the AIP Publishing

IUPAC-NIST Solubility Data Series. 102. Solubility of Nonsteroidal Anti-inflammatory Drugs (NSAIDs) in Neat Organic Solvents and Organic Solvent Mixtures

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(Received 3 March 2014; accepted 4 March 2014; published online 25 April 2014)

Solubility data are compiled and reviewed for 33 nonsteroidal anti-inflammatory drugs dissolved in neat organic solvents and in well-defined binary and ternary organic solvents. The compiled solubility data were retrieved primarily from the chemical and pharmaceutical literature covering the period from 1980 to the beginning of 2014. © *2014 AIP Publishing LLC.* [http://dx.doi.org/10.1063/1.4869683]

Key words: mixtures; NSAIDs; organic solvents; solubility.

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1. Preface

1.1. Scope of this volume

This volume reviews experimentally determined solubility data for 33 nonsteroidal anti-inflammatory drugs (NSAIDs) dissolved in neat organic solvents and well-defined binary and ternary organic solvent mixtures retrieved from the published chemical and pharmaceutical literature covering the period from 1980 to the beginning of 2014. Except for aspirin (2-acetoxybenzoic acid) and salicylic acid (2-hydroxybenzoic acid), very little physical and chemical property data are available in the published literature for NSAIDs prior to 1980. Solubility data are compiled and critically reviewed for aclofenac, celecoxib, dexibuprofen, diclofenac, diflunisal, etoricoxib, fenbufen, fentiazac, flufenamic acid, flurbiprofen, ibuprofen, indomethacin, ketoprofen, ketorolac, lornoxicam, mefenamic acid, meloxiam, nabumetone, naproxen, niflumic acid, nimesulide, phenylbutazone, piroxicam, rofecoxib, sodium diclofenac, sodium ibuprofen, sodium naproxen, sodium salicylate, tenoxicam, tolfenamic acid, and valdecoxib. Aqueous systems and inorganic systems (namely, supercritical carbon dioxide) are not included in this volume. Readers wishing solubility data for aqueous and inorganic systems are referred to Vol. 90 (Refs. 1 and 2) in the IUPAC-NIST Solubility Data Series, which dealt with the solubility of hydroxybenzoic acid derivatives in binary, ternary, and multicomponent systems. There one will find solubility data for 2-hydroxybenzoic acid (salicylic acid), 3-hydroxybenzoic acid, and 4-hydroxybenzoic acid, as well as solubility data for several 4-hydroxybenzoate alkyl esters (parabens) and hydroxybenzoic acid salts. Volume 90 also contains solubility data for the three hydroxybenzoic acids in organic solvents. Solubility data for aspirin (2-acetoxybenzoic acid) and salicylic acid (2-hydroxybenzoic acid) can be found in Vol. 99 (Ref. 3) in the IUPAC-NIST Solubility Data Series, which was devoted to the solubility of benzoic acid and substituted benzoic acids in both neat organic solvents and binary organic solvent mixtures. The solubility data reported in Vol. 99 for salicylic acid in neat organic solvents is slightly more extensive than what is contained in Vol. 90, and includes references that were either published after or overlooked in the preparation of the earlier volume. Experimental solubility data for aspirin and salicylic acid reported in Vols. 90 and 99 will not be repeated in this volume; however, there will be a brief listing of organic solvents that are included in the two earlier volumes for these two NSAIDs.

Nonsteroidal anti-inflammatory drugs represent a diverse class of drugs and are among the most commonly used analgesics for the management of pain and/or inflammation associated with rheumatoid arthritis and osteoarthritis, muscle stiffness, and pain due to Parkinson's disease, muscle injury (tendinitis and bursitis), acute gout, dysmenorrhea (menstrual pain), dental pain, migraine, and headache. Medical research is still ongoing regarding the potential of NSAIDs for the prevention of colorectal cancer. Clinical trials suggested that celecoxib is very effective in reducing polyp recurrence in individuals who have undergone colorectal polypectomy.[4,5] An estimated more than 30×10^6 people worldwide use NSAIDs on a daily basis.[6] Sales of diclofenac and ibuprofen account for more than half of the global sales of NSAIDs for osteoarthritis, and in the United States NSAID sales represent a significant fraction of the nonprescription, over-the-counter analgesic market. Side effects associated with chronic, long-term use of NSAIDs include direct and indirect irritation of the gastrointestinal tract (e.g., peptic ulcer disease, stomach bleeding, perforation, and obstruction),[7–10] increased risk of cardiovascular adverse effects (e.g., myocardial infarction and stroke, and hypertension),[11–13] renal failure (e.g., kidney failure), and erectile dysfunction.[14] Rofecoxib and valdecoxib have been withdrawn from the world market because of their association with cardiovascular risk. Valdecoxib was also withdrawn because of an unexpectedly high number of serious dermatological side effects such as Stevens-Johnson syndrome, which is a potentially deadly skin disease that usually results from a drug reaction.[15]

Nonsteroidal anti-inflammatory drugs are classified as either nonselective inhibitors or as selective COX-2 inhibitors according to their mode of action. NSAIDs relieve pain by blocking the effects of prostaglandins. Prostaglandins are substances synthesized from arachidonic acid, a fatty acid associated with cell membranes. The synthesis of prostaglandins from arachidonic acid is catalyzed by the cyclooxygenase or "COX" enzyme. Nonselective NSAIDs such as ibuprofen, indomethacin, ketoprofen, and naproxen inhibit both the cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) enzymes throughout the body, while selective NSAIDs inhibit only the COX-2 enzyme. Selective NSAIDs inhibit COX-2, an enzyme found at sites of inflammation, more than the type that is normally found in the stomach, blood platelets, and blood vessels (COX-1). Inhibition of the COX-1 enzyme can produce potential life-threatening complications, particularly in the gastrointestinal tract, as prostaglandins have an important function in protecting the mucus lining of structures and organs such as the esophagus, stomach, and intestine. When such protection is lost, the individual has an increased risk of a potentially life-threatening gastrointestinal bleeding and/or perforation. Selective NSAIDs are often prescribed/recommended by physicians for individuals who have had a peptic ulcer, gastrointestinal bleeding, or gastrointestinal upset when taking nonselective NSAIDs. Currently, celecoxib is the only selective NSAID available in the United States. Other selective NSAIDs that can be found elsewhere in the world include etoricoxib and lumiracoxib.

1.2. Concentration units for nonelectrolyte solutions

Composition of a liquid nonelectrolyte solution can be expressed in a variety of ways, as (1) the ratio of the number of moles of one component to the number of moles of a second component, n_1/n_2, etc., (2) molar concentration

$$c_i = [i] = \frac{n_i}{V} \qquad \text{SI base units : mol dm}^{-3} \tag{1}$$

(3) mole fraction

$$x_i = \frac{n_i}{n_1 + n_2 + ... + n_i + ...} \tag{2}$$

or (4) volume fraction

$$\phi_i = \frac{n_i V_i}{n_1 V_1 + n_2 V_2 + ... + n_i V_i + ...}. \tag{3}$$

Strictly speaking, the true volume of a real solution is not equal to the sum of the volumes of the individual components but is the fraction sum of partial volumes, which for a ternary solution is $V = x_1V_1 + x_2V_2 + x_3V_3$. For purposes of this study, volume fractions are defined in terms of the molar volumes of the pure unmixed components, $V_{m,i}$ (molar mass of component i divided by density of component i)

$$\varphi_i = \frac{n_i V_{m,i}}{n_1 V_{m,1} + n_2 V_{m,2} + ... + n_i V_{m,i} + ...}, \tag{4}$$

as this quantity serves as an input parameter in expressions for estimating solubilities in mixed solvents since it requires no *a priori* knowledge concerning volumetric behavior. Solute solubilities can be found in the chemical literature in terms of any of the aforementioned concentration variables, or as molality, m_i, which is the number of moles of solute i divided by the mass of the solvent

$$m_i = \frac{n_i}{n_{\text{solvent}} M_{\text{solvent}}} \qquad \text{SI base units : mol kg}^{-1}, \tag{5}$$

where M_{solvent} is the molar mass of the solvent.

1.3. Procedures used in critical evaluation of published solubility data

Procedures used in the critical evaluation of published solubility data for crystalline nonelectrolytes dissolved in organic monosolvents and organic solvent mixtures depend to a large extent on the quantity and type of data to be evaluated. In those instances where independent experimental measurements exist, one can compute the mean value and standard deviation for each set of replicate values (or set of values) differing from the rest. This type of analysis will be limited primarily to the neat mono-solvents, as published data for binary and ternary solvent mixtures is relatively scarce compared to solubility data for solutes in single-solvent systems. Given the scarcity of binary solvent and ternary solvent solubility data, researchers have tended to perform measurements on new mixtures as opposed to repeating measurements on already studied mixtures, even if measured at different temperatures.

Published solubility data may be found for a given solute-solvent system measured at several different temperatures. The temperature variation can be critically evaluated using standard thermodynamic relationships based on the ideal mole fraction solubility of a solid solute, $x_1^{\text{ideal soly}}$ in a liquid solvent[16]

$$-\ln x_1^{\text{ideal soly}} = \frac{\Delta H_1^{\text{fus}}}{RT}\left[1 - \frac{T}{T_{\text{mp}}}\right] + \frac{\Delta C_{p,1}}{R}\left(\frac{T_{\text{mp}} - T}{T}\right) + \frac{\Delta C_{p,1}}{R}\ln\left(\frac{T_{\text{mp}}}{T}\right), \tag{6}$$

where ΔH_1^{fus} is the standard molar enthalpy of fusion of the solute at its normal melting point temperature, T_{mp}, $\Delta C_{p,1}$ is the difference in the molar heat capacities of the liquid and crystalline forms of the solute ($\Delta C_{p,1} = C_{p,\text{liquid}} - C_{p,\text{solid}}$), and R is the universal gas constant. Through suitable algebraic manipulations, Eq. (6) can be rearranged to give

$$\ln x_1^{\text{ideal soly}} = \left[\frac{\Delta H_1^{\text{fus}}}{RT_{\text{mp}}} + \frac{\Delta C_{p,1}}{R}(1 + \ln T_{\text{mp}})\right] - \left(\frac{\Delta H_1^{\text{fus}}}{R} + \frac{\Delta C_{p,1} T_{\text{mp}}}{R}\right)\frac{1}{T} + \frac{\Delta C_{p,1}}{R}\ln T, \tag{7}$$

which has the generalized mathematical form of

$$\ln x_1 = A + \frac{B}{T} + C\ln T. \tag{8}$$

Though derived for an ideal solution, Eq. (8) has been used successfully to describe solute solubility in many nonideal solutions. The equation is commonly referred to as the Modified Apelblat equation in the published literature.

The λh model, developed by Buchowski *et al.*,[17,18] is

$$\ln\left[1 + \frac{\lambda(1 - x_1)}{x_1}\right] = \lambda h\left(\frac{1}{T} - \frac{1}{T_{\text{mp}}}\right), \tag{9}$$

a second popular mathematical representation for describing how the mole fraction solubility varies with solution temperature. In Eq. (9), T and T_{mp} refer to the solution temperature and melting-point temperature of the solute, respectively. The two model parameters, λ and h, are determined by least-squares analyses using the measured mole-fraction solubilities. Experimental solubility data are considered to be internally consistent if the measured x_i values can be accurately described by either Eq. (8) and/or Eq. (9).

Solution models have been used with success to rationalize the solubility behavior of a given solute molecule in a series of organic solvents. Of the models developed in recent years, the general solvation parameter developed by Abraham and coworkers[19–27] is probably the most widely used approach in correlating the solubilities of crystalline organic compounds. The model is based on two linear free energy relationships describing solute transfer between two immiscible phases. The first expression quantifies solute transfer between two

condensed phases:

$$\log_{10}(SR \text{ or } P) = c_p + e_p \cdot E + s_p \cdot S + a_p \cdot A + b_p \cdot B + v_p \cdot V \quad (10)$$

and the second expression involves solute transfer from the gas phase:

$$\log_{10}(GSR \text{ or } K) = c_k + e_k \cdot E + s_k \cdot S + a_k \cdot A + b_k \cdot B + l_k \cdot L, \quad (11)$$

where P is the water-to-organic solvent partition coefficient or nonpolar organic solvent-to-polar organic solvent partition coefficient, and K is the gas-to-organic solvent partition coefficient. For solubility predictions, the Abraham model uses the solubility ratio which is given by the ratio of the molar solubilities of the solute in the organic solvent, $c^{sat}_{1,S}$, and in water, $c^{sat}_{1,W}$ (i.e., $SR = c^{sat}_{1,S}/c^{sat}_{1,W}$). The gas-phase solubility ratio is similarly calculated as the molar solubility in the organic solvent divided by the solute gas-phase concentration (i.e., $GSR = c^{sat}_{1,S}/c_{1,G}$), the latter value calculable from the solute vapor pressure above the solid at the solution temperature.

The dependent variables in Eqs. (10) and (11) are solute descriptors as follows: E is the solute excess molar refraction (in units of $cm^3\ mol^{-1}/10$), S refers to the solute dipolarity/polarizability, A and B represent the overall solute hydrogen bond acidity and basicity, V denotes the solute's McGowan characteristic molecular volume (in units of $cm^3\ mol^{-1}/100$) and L is the logarithm of the gas-to-hexadecane partition coefficient measured at 298 K. The lower-case regression coefficients and constants (c_p, e_p, s_p, a_p, b_p, v_p, c_k, e_k, s_k, a_k, b_k, and l_k) in Eqs. (10) and (11) are obtained by multiple linear regression analysis of experimental partition coefficient data and solubility ratios for a specific biphasic system. To date, Abraham model correlations have been developed for predicting the solubility of crystalline nonelectrolytes in more than 70 different organic solvents,[28–35] for predicting the water-to-organic solvent and gas-to-organic solvent partition coefficient for more than 70 different biphasic systems,[28–37] and for predicting the partition coefficients of organic vapors and gaseous solutes into aqueous micellar solvent media,[38,39] into humic acid,[40] and into various body tissues and fluids.[41–47] Each of the aforementioned predictions requires *a priori* knowledge of the compound's solute descriptors as input parameters.

Equation (10) correlates experimental partition coefficients and/or solubility ratios, and for select organic solvents both "dry" and "wet" equation coefficients have been reported. For solvents that are partially miscible with water, such as 1-pentanol and butyl ethanoate, solubility ratios calculated as the molar solute solubility in the organic solvent divided by the solute's aqueous molar solubility are not the same as those obtained from direct partition between water (saturated with the organic solvent) and organic solvent (saturated with water). Care must be taken not to confuse the two sets of transfer process. There should be no confusion in the case of solvents that are fully miscible with water, such as ethanol. Only one set of equation coefficients has been published, and the dependent variable is the logarithm of the solubility ratio. And for solvents that are "almost" completely immiscible with water, such as alkylbenzenes (benzene, toluene, *etc.*) and chloroalkanes (1,2-dichloroethane, chloroform), there should be no confusion because the solubility ratio [see Eq. (3)] will be nearly identical to the practical partition coefficient.

Applicability of the Abraham solvation parameter model is fairly straightforward. One starts with the set of equations that have been obtained for the ratio of the molar solubilities of the solute in the organic solvent and in water (i.e., $SR = c^{sat}_{1,S}/c^{sat}_{1,W}$). Table 1 lists the coefficients in Eq. (10) for transfer processes

TABLE 1. Abraham model equation coefficients describing solute transfer to an organic solvent from water, Eq. (10)

Organic solvent	c_p	e_p	s_p	a_p	b_p	v_p
Dichloromethane	0.319	0.102	−0.187	−3.058	−4.090	4.324
Trichloromethane	0.191	0.105	−0.403	−3.112	−3.514	4.395
Tetrachloromethane	0.199	0.523	−1.159	−3.560	−4.594	4.618
1,2-Dichloroethane	0.183	0.294	−0.134	−2.801	−4.291	4.180
1-Chlorobutane	0.222	0.273	−0.569	−2.918	−4.883	4.456
Hexane	0.333	0.560	−1.710	−3.578	−4.939	4.463
Heptane	0.297	0.634	−1.755	−3.571	−4.946	4.488
Octane	0.241	0.690	−1.769	−3.545	−5.011	4.511
Decane	0.172	0.726	−1.750	−3.446	−4.496	4.489
Undecane	0.058	0.603	−1.661	−3.421	−5.120	4.619
Dodecane	0.114	0.668	−1.644	−3.545	−5.006	4.459
Hexadecane	0.087	0.667	−1.617	−3.587	−4.869	4.433
Cyclohexane	0.159	0.784	−1.678	−3.740	−4.929	4.577
Methylcyclohexane	0.246	0.782	−1.982	−3.517	−4.293	4.528
2,2,4-Trimethylpentane	0.318	0.555	−1.737	−3.677	−4.864	4.417
Benzene	0.142	0.464	−0.588	−3.099	−4.625	4.491
Toluene	0.125	0.431	−0.644	−3.002	−4.748	4.524
Ethylbenzene	0.093	0.467	−0.723	−3.001	−4.844	5.514
1,2-Dimethylbenzene	0.083	0.518	−0.813	−2.884	−4.821	4.559

TABLE 1. Abraham model equation coefficients describing solute transfer to an organic solvent from water, Eq. (10)—Continued

Organic solvent	c_p	e_p	s_p	a_p	b_p	v_p
1,3-Dimethylbenzene	0.122	0.377	−0.603	−2.981	−4.961	4.535
1,4-Dimethylbenzene	0.166	0.477	−0.812	−2.939	−4.874	4.532
Fluorobenzene	0.139	0.152	−0.374	−3.030	−4.601	4.540
Chlorobenzene	0.065	0.381	−0.521	−3.183	−4.700	4.614
Bromobenzene	−0.017	0.436	−0.424	−3.174	−4.558	4.445
Iodobenzene	−0.192	0.298	−0.308	−3.213	−4.653	4.588
Nitrobenzene	−0.152	0.525	0.081	−2.332	−4.494	4.187
Benzonitrile	0.097	0.285	0.059	−1.605	−4.562	4.028
Olive oil	−0.035	0.574	−0.798	−1.422	−4.984	4.210
Carbon disulfide	0.047	0.686	−0.943	−3.603	−5.818	4.921
Isopropyl myristate	−0.605	0.930	−1.153	−1.682	−4.093	4.249
Triolein	0.385	0.983	−2.083	−2.007	−3.452	4.072
Methanol	0.276	0.334	−0.714	0.243	−3.320	3.549
Ethanol	0.222	0.471	−1.035	0.326	−3.596	3.857
Propan-1-ol	0.139	0.405	−1.029	0.247	−3.767	3.986
Butan-1-ol	0.165	0.401	−1.011	0.056	−3.958	4.044
Pentan-1-ol	0.150	0.536	−1.229	0.141	−3.864	4.077
Hexan-1-ol	0.115	0.492	−1.164	0.054	−3.978	4.131
Heptan-1-ol	0.035	0.398	−1.063	0.002	−4.342	4.317
Octan-1-ol	−0.034	0.489	−1.044	−0.024	−4.235	4.218
Decan-1-ol	−0.058	0.616	−1.319	0.026	−4.153	4.279
Propan-2-ol	0.102	0.315	−1.020	0.532	−3.865	4.023
2-Methylpropan-1-ol	0.161	0.310	−1.069	0.183	−3.774	4.040
2-Butanol	0.194	0.383	−0.956	0.134	−3.606	3.829
2-Methylpropan-2-ol	0.197	0.136	−0.916	0.318	−4.031	4.112
3-Methylbutan-1-ol	0.123	0.370	−1.243	0.074	−3.781	4.208
2-Pentanol	0.115	0.455	−1.331	0.206	−3.745	4.201
Ethylene glycol	−0.270	0.578	−0.511	0.715	−2.619	2.729
2,2,2-Trifluoroethanol	0.395	−0.094	−0.594	−1.280	−1.274	3.088
1,1′-Oxybisethane	0.330	0.401	−0.814	−0.457	−4.959	4.320
Tetrahydrofuran	0.207	0.372	−0.392	−0.236	−4.934	4.447
Dioxane	0.098	0.350	−0.083	−0.556	−4.826	4.172
1,1′-Oxybisbutane	0.203	0.369	−0.954	−1.488	−5.426	4.508
2-Methoxy-2-methylpropane	0.376	0.264	−0.788	−1.078	−5.030	4.410
Methyl ethanoate	0.351	0.223	−0.150	−1.035	−4.527	3.972
Ethyl ethanoate	0.328	0.369	−0.446	−0.700	−4.904	4.150
Propyl ethanoate	0.288	0.363	−0.474	−0.784	−4.939	4.216
Butyl ethanoate	0.248	0.356	−0.501	−0.867	−4.973	4.281
Propanone	0.313	0.312	−0.121	−0.608	−4.753	3.942
Butanone	0.246	0.256	−0.080	−0.767	−4.855	4.148
Cyclohexanone	0.038	0.225	0.058	−0.976	−4.842	4.315
Propylene carbonate	0.004	0.168	0.504	−1.283	−4.407	3.421
Dimethylformamide	−0.305	−0.058	0.343	0.358	−4.865	4.486
Dimethylacetamide	−0.271	0.084	0.209	0.915	−5.003	4.557
Diethylacetamide	0.213	0.034	0.089	1.342	−5.084	4.088
Dibutylformamide	0.332	0.302	−0.436	0.358	−4.902	3.952
N-Methylpyrolidinone	0.147	0.532	0.225	0.840	−4.794	3.674
N-Methyl-2-piperidone	0.056	0.332	0.257	1.556	−5.035	3.983
N-Formylmorpholine	−0.032	0.696	−0.062	0.014	−4.092	3.405
N-Methylformamide	0.114	0.407	−0.287	0.542	−4.085	3.471
N-Ethylformamide	0.220	0.034	−0.166	0.935	−4.589	3.730
N-Methylacetamide	0.090	0.205	−0.172	1.305	−4.589	3.833
N-Ethylacetamide	0.284	0.128	−0.442	1.180	−4.728	3.856
Formamide	−0.171	0.070	0.308	0.589	−3.152	2.432
Acetonitrile	0.413	0.077	0.326	−1.566	−4.391	3.364
Nitromethane	0.023	−0.091	0.793	−1.463	−4.364	3.460
Dimethylsulfoxide	−0.194	0.327	0.791	1.260	−4.540	3.361
Sulfolane (303 K)	0.000	0.147	0.601	−0.318	−4.541	3.290
Tributylphosphate	0.327	0.570	−0.837	−1.069	−4.333	3.919
Gas-water	−0.994	0.577	2.549	3.813	4.841	−0.869

considered in the present volume. It is noted that coefficients are periodically revised when additional experimental data becomes available. Thus, if $c^{sat}_{1,W}$ is known, predicted $\log_{10}SR$ values based upon Eq. (10) will lead to predicted molar solubilities in organic solvents through $SR = c^{sat}_{1,S}/c^{sat}_{1,W}$.

Solubilities in organic solvents can also be predicted and correlated with Eq. (11). Listed in Table 2 are the equation coefficients that have been previously determined for the gas-phase solubility ratio, $GSR = c^{sat}_{1,S}/c_{1,G}$. Predicted $\log_{10}GSR$ values can also be converted to saturation molar solubilities, provided that the saturated vapor pressure above the crystalline solute at 298.15 K, $VP°$, is known. $VP°$ is transformed into the solute's gas-phase molar concentration, $c_{1,G}$, which is then used to calculate the respective gas-to-water and gas-to-solvent partition coefficients, GSR_W and GSR_S:

$$GSR_W = c^{sat}_{1,W}/c^{sat}_{1,G} \quad \text{or} \quad \log_{10}GSR_W = \log_{10}c^{sat}_{1,W} - \log_{10}c_{1,G} \tag{12}$$

$$GSR_S = c^{sat}_{1,S}/c_{1,G} \quad \text{or} \quad \log_{10}GSR_S = \log_{10}c^{sat}_{1,S} - \log_{10}c_{1,G} \tag{13}$$

TABLE 2. Abraham model equation coefficients describing solute transfer to an organic solvent from gas phase, Eq. (11)

Organic Solvent	c_k	e_k	s_k	a_k	b_k	l_k
Oleyl alcohol	−0.268	−0.392	0.800	3.117	0.978	0.918
Dichloromethane	0.192	−0.572	1.492	0.460	0.847	0.965
Trichloromethane	0.157	−0.560	1.259	0.374	1.333	0.976
Tetrachloromethane	0.217	−0.435	0.554	0.000	0.000	1.069
1,2-Dichloroethane	0.017	−0.337	1.600	0.774	0.637	0.921
1-Chlorobutane	0.130	−0.581	1.114	0.724	0.000	1.016
Hexane	0.320	0.000	0.000	0.000	0.000	0.945
Heptane	0.284	0.000	0.000	0.000	0.000	0.950
Octane	0.219	0.000	0.000	0.000	0.000	0.960
Decane	0.159	0.000	0.000	0.000	0.000	0.972
Undecane	0.113	0.000	0.000	0.000	0.000	0.971
Dodecane	0.053	0.000	0.000	0.000	0.000	0.986
Hexadecane	0.000	0.000	0.000	0.000	0.000	1.000
Cyclohexane	0.163	−0.110	0.000	0.000	0.000	1.013
Methylcyclohexane	0.318	−0.215	0.000	0.000	0.000	1.012
2,2,4-Trimethylpentane	0.264	−0.230	0.000	0.000	0.000	0.975
Benzene	0.107	−0.313	1.053	0.457	0.169	1.020
Toluene	0.085	−0.400	1.060	0.501	0.154	1.011
Ethylbenzene	0.059	−0.295	0.924	0.537	0.098	1.010
1,2-Dimethylbenzene	0.064	−0.296	0.934	0.647	0.000	1.010
1,3-Dimethylbenzene	0.071	−0.423	1.068	0.552	0.000	1.014
1,4-Dimethylbenzene	0.113	−0.302	0.826	0.651	0.000	1.011
Fluorobenzene	0.181	−0.621	1.432	0.647	0.000	0.986
Chlorobenzene	0.064	−0.399	1.151	0.313	0.171	1.032
Bromobenzene	−0.064	−0.326	1.261	0.323	0.292	1.002
Iodobenzene	−0.171	−0.192	1.197	0.245	0.245	1.002
Nitrobenzene	−0.295	0.121	1.682	1.247	0.370	0.915
Benzonitrile	−0.075	−0.341	1.798	2.030	0.291	0.880
Olive oil	−0.159	−0.277	0.904	1.695	−0.090	0.876
Carbon disulfide	0.101	0.251	0.177	0.027	0.095	1.068
Triolein	0.147	0.254	−0.246	1.520	1.473	0.918
Methanol	−0.039	−0.338	1.317	3.826	1.396	0.773
Ethanol	0.017	−0.232	0.867	3.894	1.192	0.846
Propan-1-ol	−0.042	−0.246	0.749	3.888	1.076	0.874
Butan-1-ol	−0.004	−0.285	0.768	3.705	0.879	0.890
Pentan-1-ol	−0.002	−0.161	0.535	3.778	0.960	0.900
Hexan-1-ol	−0.014	−0.205	0.583	3.621	0.891	0.913
Heptan-1-ol	−0.056	−0.216	0.554	3.596	0.803	0.933
Octan-1-ol	−0.147	−0.214	0.561	3.507	0.749	0.943
Decan-1-ol	−0.139	−0.090	0.356	3.547	0.727	0.958
Propan-2-ol	−0.062	−0.327	0.707	4.024	1.072	0.886
2-Methylpropan-1-ol	0.012	−0.407	0.670	3.645	1.283	0.895
Butan-2-ol	−0.017	−0.376	0.852	3.740	1.161	0.867
2-Methylpropan-2-ol	0.071	−0.538	0.818	3.951	0.823	0.905
3-Methylbutan-1-ol	−0.014	−0.341	0.525	3.666	1.096	0.925
2-Pentanol	−0.031	−0.325	0.496	3.792	1.024	0.934
Ethylene glycol	−0.887	0.132	1.657	4.457	2.325	0.565
2,2,2-Trifluoroethanol	−0.092	−0.547	1.339	2.213	3.807	0.645
1,1′-Oxybisethane	0.288	−0.347	0.775	2.985	0.000	0.973
Tetrahydrofuran	0.189	−0.347	1.238	3.289	0.000	0.982

TABLE 2. Abraham model equation coefficients describing solute transfer to an organic solvent from gas phase, Eq. (11)—Continued

Organic Solvent	c_k	e_k	s_k	a_k	b_k	l_k
Dioxane	−0.034	−0.354	1.674	3.021	0.000	0.919
1,1′-Oxybisbutane	0.165	−0.421	0.760	2.102	−0.664	1.002
2-Methoxy-2-methylpropane	0.278	−0.489	0.801	2.495	0.000	0.993
Methyl ethanoate	0.129	−0.447	1.675	2.625	0.213	0.874
Ethyl ethanoate	0.182	−0.352	1.316	2.891	0.000	0.916
Propyl ethanoate	0.165	−0.383	1.264	2.757	0.000	0.954
Butyl ethanoate	0.147	−0.414	1.212	2.623	0.000	0.954
Propanone	0.127	−0.387	1.733	3.060	0.000	0.866
Butanone	0.112	−0.474	1.671	2.878	0.000	0.916
Cyclohexanone	−0.086	−0.441	1.725	2.786	0.000	0.957
Propylene carbonate	−0.356	−0.413	2.587	2.207	0.455	0.719
Dimethylformamide	−0.391	−0.869	2.107	3.774	0.000	1.011
Dimethylacetamide	−0.308	−0.736	1.802	4.361	0.000	1.028
Diethylacetamide	−0.075	−0.434	1.911	4.801	0.000	0.899
Dibutylformamide	−0.002	−0.239	1.402	4.029	0.000	0.900
N-Methylpyrrolidinone	−0.128	−0.029	2.217	4.429	0.000	0.777
N-Methyl-2-piperidone	−0.264	−0.171	2.086	5.056	0.000	0.883
N-Formylmorpholine	−0.437	0.024	2.631	4.318	0.000	0.712
N-Methylformamide	−0.249	−0.142	1.661	4.147	0.817	0.739
N-Ethylformamide	−0.220	−0.302	1.743	4.498	0.480	0.824
N-Methylacetamide	−0.197	−0.175	1.608	4.867	0.375	0.837
N-Ethylacetamide	−0.018	−0.157	1.352	4.588	0.357	0.824
Formamide	−0.800	0.310	2.292	4.130	1.933	0.442
Acetonitrile	−0.007	−0.595	2.461	2.085	0.418	0.738
Nitromethane	−0.340	−0.297	2.689	2.193	0.514	0.728
Dimethylsulfoxide	−0.556	−0.223	2.903	5.036	0.000	0.719
Sulfolane (303 K)	−0.414	0.084	2.396	3.144	0.420	0.684
Tributylphosphate	0.097	−0.098	1.103	2.411	0.588	0.844
Gas-water	−1.271	0.822	2.743	3.904	4.814	−0.213

An estimated value of $c_{1,G}$ can be assumed in the preliminary calculations if an experimental vapor pressure cannot be located in the published literature for the solute at 298.15 K. The value can be adjusted if necessary in order to reduce the $\log_{10}GSR$ deviations, and to make the $\log_{10}SR$ and $\log_{10}GSR$ computations internally consistent as discussed in several previous publications.

Three specific conditions must be met in order to use the Abraham solvation parameter model to predict saturation solubilities. First, the same solid phase must be in equilibrium with the saturated solutions in the organic solvent and in water (i.e., there should be no solvate or hydrate formation). Second, the secondary medium activity coefficient of the solid in the saturated solutions must be unity (or near unity). This condition generally restricts the method to those solutes that are sparingly soluble in water and nonaqueous solvents. Finally, for solutes that are ionized in aqueous solution, $c_{A,water}$ refers to the solubility of the neutral monomeric form. In the cases of aspirin, ibuprofen, ketoprofen and naproxen (and other NSAIDs with a COOH functional group), this will limit the model to solvents such as alcohols, short alkyl chain ethers, alkyl alkanoates and propylene carbonate. Carboxylic acids are known to dimerize in alkane and nonpolar aromatic solvents. The second restriction may not be as important as initially believed. The Abraham solvation parameter model has shown remarkable success in correlating the solubility of several very soluble crystalline solutes. For example, Eqs. (10) and (11) described the molar solubility of benzil in 24 organic solvents to within overall standard deviations of 0.124 and 0.109 $\log_{10}$ units, respectively.[35] Standard deviations for aspirin dissolved in 13 alcohols, 4 ethers, and ethyl ethanoate were 0.123 and 0.138 $\log_{10}$ units.[25] Benzil[48] and aspirin[25] exhibited solubilities exceeding 1 molar in several of the organic solvents studied. In the case of aspirin it could be argued that the model's success relates back to when the equation coefficients were originally calculated for the dry solvents. The databases used in the regression analyses contained very few carboxylic acid solutes (benzoic acid, 2-hydroxybenzoic acid, and 4-hydroxybenzoic acid). Most of the experimental data for carboxylic acids and other very acidic solutes were in the form of saturation solubilities, which were also in the 1–3 molar range. Such arguments do not explain why Eqs. (10) and (11) described the measured benzil solubility data. The benzil solubilities were measured after most of the equation coefficients were first determined.

Numerical values of solute descriptors exist for more than 5000 different organic and organometallic compounds, and if not readily available are easily calculable from measured partition coefficient and solubility data.[20,28,40,49,50] The McGowan volume solute descriptor, V, is calculated from the molecular formula and the number of chemical bonds in the solute as follows:[51]

$$V = \sum_{i}^{\text{atoms}} n_i AV_i - 6.56 n_{\text{bonds}}, \tag{14}$$

where n_i and AV_i denote the number of atoms and atomic volume of element i in the solute molecule, respectively, and n_{bonds} is the number of chemical bonds. The bond contribution is 6.56 $cm^3\,mol^{-1}$ for each bond, no matter whether single, double, or triple, to be subtracted. In other words, double and triple bonds count as one bond. Numerical values of AV_i for elements present in NSAIDs are: AV_C = 16.35 $cm^3\,mol^{-1}$; AV_H = 8.71 $cm^3\,mol^{-1}$; AV_N = 14.39 $cm^3\,mol^{-1}$; AV_O = 12.43 $cm^3\,mol^{-1}$; AV_F = 10.48 $cm^3\,mol^{-1}$; AV_{Cl} = 20.95 $cm^3\,mol^{-1}$; AV_{Br} = 26.21 $cm^3\,mol^{-1}$; AV_I = 34.53 $cm^3\,mol^{-1}$; AV_S = 22.91 $cm^3\,mol^{-1}$; and AV_P = 24.87 $cm^3\,mol^{-1}$.

The numerical value of the excess molar refraction solute descriptor, E, is also fairly easy to calculate. It is defined as the molar refraction of the solute using McGowan's volume, MR_X, minus the molar refraction of an alkane having the same McGowan volume. The molar refraction is given by[20]

$$MR_X = 10\left[\frac{(\eta^2-1)}{(\eta^2+2)}\right]V, \tag{15}$$

where η is the refractive index of the solute as a pure liquid at 293 K, and V is in units of $(cm^3\,mol^{-1})/100$. For compounds that are solid at 293 K, a refractive index for the liquid at 293 K can be calculated by commercial software;[52] or alternatively E can be computed by summing fragment groups in the molecule[53] or by using the PharmaAlgorithm commercial software.[54] The molar refraction is one of the few properties that is the same for a given molecule in both the gaseous and liquidus state, even for associated liquid molecules such as water. The numerical value of molar refraction of the alkane molecule needed in the computation of E is given by[20]

$$(MR_X)_{alkane} = 2.83195V - 0.52553, \tag{16}$$

where V is the characteristic McGowan volume described above. The remaining four solute descriptors, S, A, B, and L, are calculated by solving a series of simultaneous $\log_{10}P$ and $\log_{10}K$ equations for which both experimental partition coefficient data and solvent equation coefficients (c_p, e_p, s_p, a_p, b_p, v_p, c_k, e_k, s_k, a_k, b_k, and l_k) are known. The computation method is illustrated in several published papers and will not be repeated here.

The Abraham general solvation parameter model has been used successfully to correlate the solubility behavior of several NSAIDs (aspirin, ibuprofen, ketoprofen, naproxen, and salicylic acid) dissolved in a series of alcohols, dialkyl ethers, and alkyl alkanoates. Equations (10) and (11) described the experimental solubility data to within a standard deviation of ±0.15 $\log_{10}$ units. Past experience in using various solution models has been that the better solution will generally give predicted values that fall with ±40% or so (about ±0.15 $\log_{10}$ units) of the observed solute solubilities. The Abraham model will be used to assess the experimental solubility data for a few select NSAIDs, and to identify possible values that need to be remeasured. More detailed information concerning the model will be given later in the volume when actual experimental solubility data are being evaluated.

The dependence of solubility upon solvent composition is generally evaluated using semi-theoretical solution models. During the past 50 years, more than 100 solution models have been developed for describing variation of solubility with solvent composition based on different assumptions regarding how molecules interact in solution. Predictive expressions derived from several of the proposed solution models have served as mathematical representations for isothermal solubility data in binary and ternary solvent mixtures, and for identifying experimental data points in need of redetermination. The Combined Nearly Ideal Binary Solvent (NIBS)/Redlich-Kister equation is[55,56]

$$\ln x_1^{sat} = x_2^{(s)}\ln\left(x_1^{sat}\right)_2 + x_3^{(s)}\ln\left(x_1^{sat}\right)_3 + x_2^{(s)}x_3^{(s)}\sum_{j=0}^{r} S_{23,j}\left(x_2^{(s)} - x_3^{(s)}\right)^j, \tag{17}$$

likely the most popular of the proposed mathematical representations. In Eq. (17), $x_i^{(s)}$'s refer to the initial mole fraction solvent composition of component i calculated as if the solute were not present, and $(x_A^{sat})_i$ denotes the measured solute solubility in pure solvent i. The summation in the last term on the right-hand side of Eq. (17) includes as many curve-fit $S_{23,i}$ parameters as are needed to accurately describe the observed solubility data. Generally, no more than three parameters will be needed in a given mathematical representation. The $S_{23,i}$ parameters are determined by regression analysis.

The popularity of the Combined NIBS/Redlich-Kister model results from the fact that the computed $S_{IJ,i}$ parameters can be used to predict solute solubility in ternary solvent systems:

$$\begin{aligned}\ln x_1^{sat} = {} & x_2^{(s)}\ln\left(x_1^{sat}\right)_2 + x_3^{(s)}\ln\left(x_1^{sat}\right)_3 \\ & + x_4^{(s)}\ln\left(x_1^{sat}\right)_4 \\ & + x_2^{(s)}x_3^{(s)}\sum_{j=0}^{r} S_{23,j}\left(x_2^{(s)} - x_3^{(s)}\right)^j \\ & + x_2^{(s)}x_4^{(s)}\sum_{k=0}^{s} S_{24,k}\left(x_2^{(s)} - x_4^{(s)}\right)^k \\ & + x_3^{(s)}x_4^{(s)}\sum_{l=0}^{t} S_{34,l}\left(x_3^{(s)} - x_4^{(s)}\right)^l\end{aligned} \tag{18}$$

and in higher-order multicomponent solvent systems:

$$\ln x_1^{sat} = \sum_{I}^{Solvents}\sum_{J>I}^{Solvents}\left[x_I^{(s)}x_J^{(s)}\sum_{k=0}^{n} S_{IJ,k}\left(x_I^{(s)} - x_J^{(s)}\right)^k\right]. \tag{19}$$

Equation (18) is referred to as the Combined Nearly Ideal Ternary Solvent (NITS)/Redlich-Kister model. To date, Eq. (18) has been shown to provide very accurate predictions for the solubility of anthracene and/or pyrene in 114 different ternary solvent mixtures including several alcohol + hydrocarbon + hydrocarbon, alcohol + alcohol + hydrocarbon, alkoxyalcohol + alcohol + hydrocarbon, alkoxyalcohol + alcohol + alcohol, and alkyl ether + alcohol + hydrocarbon solvent systems.[57–59]

2. Solubility of Alclofenac in Organic Solvents

2.1. Critical evaluation of experimental solubility data

Alclofenac (more formally named 3-chloro-4-(2-propen-1-yloxy)benzeneacetic acid) is a nonsteroidal anti-inflammatory drug administered orally to provide systematic relief and reduce pain in indidivudals suffering with rheumatoid arithritis and osteoarthritis. There has been only a single publication reporting the solubility of alclofenac in organic solvents. Fini *et al.*[60] determined the molar solubility of alclofenac in 1-octanol at only three temperatures from 278 to 310 K. It is not possible to perform a critical evaluation of the experimental data as measurements were made at too few temperatures to permit a meaningful linear regression analysis, and there are no independent experimental solubility data for alclofenac in 1-octanol.

The experimental solubility data for alclofenac in organic solvents are given in Sec. 2.2.

2.2. Alclofenac solubility data in alcohols

Components:	**Original Measurements:**
(1) 3-Chloro-4-(2-propen-1-yloxy)-benzeneacetic acid (Alclofenac); $C_{11}H_{11}ClO_3$; [22131-79-9] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.303
298.2	0.610
310.2	1.303

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

3. Solubility of Aspirin in Organic Solvents

3.1. Critical evaluation of experimental solubility data

Volume 99 (Ref. 3) in the IUPAC-NIST Solubility Data Series contained experimental solubility data for aspirin (more formally named 2-acetoxybenzoic acid) dissolved in two aromatic hydrocarbons (benzene and methylbenzene), in four alkyl alkanoates (ethyl ethanoate, butyl ethanoate, pentyl ethanoate, and methyl butanoate), in four dialkyl ethers (1,1-oxybisethane, 2,2′-oxybispropane, 1,1-oxybisbutane, and 2-methoxy-2-methylpropane), and two cyclic ethers (tetrahydrofuran and 1,4-dioxane), in one haloalkane (trichloromethane), in 22 alcohols (methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 2-butanol, 2-methyl-1-propanol, 2-methyl-2-propanol, 1-pentanol, 2-pentanol, 2-methyl-1-butanol, 3-methyl-1-butanol, 2-methyl-2-butanol, 1-hexanol, 2-methyl-1-pentanol, 4-methyl-2-pentanol, 1-heptanol, 1-octanol, 2-ethyl-1-hexanol, 1-decanol, 3,7-dimethyl-1-octanol, and 1,2-propanediol), in one alkanone (propanone), and in two miscellaneous organic solvents (propylene carbonate and ethanenitrile). Except for a few select systems, the majority of the compiled solubility data was measured at 298.15 K. Maia and Giulietti[61] determined the solubility of 2-acetoxybenzoic acid in ethanol (from 276 to 336 K), 2-propanol (from 282 to 330 K), 1,2-propanediol (from 295 to 334 K), and propanone (from 282 to 326 K) as a function of temperature using a dynamic solubility method that recorded the temperature at which the last crystal of aspirin dissolved in the respective solvent. McLoughlin *et al.*[62] reported the solubility of aspirin in ethanol at both 293 and 333 K, while Lindenberg *et al.*[63] performed solubility measurements of aspirin in ethanol at 298, 308, and 323 K. The authors compared the experimental values determined using an *in situ* ATR-FTIR spectroscopic method to measured values based on a gravimetric method. The compiled solubility data were correlated with the Abraham solvation parameter model.

Solubility data contained in Vol. 99 will not be republished here. The listing above is provided so that readers will know what solubility data are available in the earlier volume for aspirin. There were two additional solubility measurements found in the published pharmaceutical literature for aspirin. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. Rytting *et al.*[65] determined the solubility of aspirin in polyethylene glycol 400 (PEG 400) at ambient room temperature.

These experimental solubility data for aspirin in organic solvents are given in Sec. 3.2.

3.2. Aspirin solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 2-Acetoxybenzoic acid (Aspirin); $C_9H_8O_4$; [50-78-2]	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
(2) Mineral oil	
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000173$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Merck Chemical Company, Darmstadt, Germany, no purification details were provided.
(2) Purity not given, Parafluid Mineralolgesellschaft, Hamburg, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	Original Measurements:
(1) 2-Acetoxybenzoic acid (Aspirin); $C_9H_8O_4$; [50-78-2]	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.738$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

4. Solubility of Celecoxib in Organic Solvents

4.1. Critical evaluation of experimental solubility data

Celecoxib (more formally named 4-[5-(4-methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzenesulfonamide) is a NSAID (selective COX-2 inhibitor) used in the treatment of osteoarthritis, rheumatoid arthritis, and to reduce numbers of colon and rectum polyps in individuals who have undergone colorectal polypectomy. There have been two studies involving the solubility of celecoxib in organic solvents at 298 K. Most notably, Thimmasetty *et al.*[66] measured the mole-fraction solubility of celecoxib in 17 different organic solvents, including two saturated hydrocarbons (hexane and cyclohexane), one cyclic ether (1,4-dioxane), one chloroalkane (tetrachloromethane), and 11 alcohols (methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, 1-octanol, 1,2-propanediol, and 1,2,3-propanetriol), as well as in the binary aqueous-dioxane solvent system at six different mixture compositions. The experimental data were used to calculate the solubility parameter of celecoxib. Seedher and Bhatia[67] published molar solubility data for celecoxib in six alcohols (methanol, ethanol, 1-butanol, 1-octanol, 1,2-ethanediol, and 1,2-propanediol), in polyethylene glycol 400 (PEG 400), and in binary solvent mixtures containing ethanol and PEG 400. It is not possible to perform a critical evaluation as all measurements were performed at only a single temperature, and there are at most only two independent experimental values for the common solvents studied by both research groups. There are noticeable differences between the two independent experimental determinations: $c_1 = 0.273$ mol dm^{-3} (Ref. 66 mole-fraction solubility converted to molar solubility) versus $c_1 = 0.166$ mol dm^{-3} (Ref. 67) for ethanol; $c_1 = 0.141$ mol dm^{-3} (Ref. 66 mole-fraction solubility converted to molar solubility) versus $c_1 = 0.0761$ mol dm^{-3} (Ref. 67) for 1-butanol; $c_1 = 0.0325$ mol dm^{-3} (Ref. 66 mole-fraction solubility converted to molar solubility) versus $c_1 = 0.0206$ mol dm^{-3} (Ref. 67) for 1-octanol. Polymorphism could explain fairly large differences in solubilities in a given solvent; however, in the case of celecoxib a differential scanning calorimetric study[68] failed to show a significant difference in the enthalpy of fusion data for celecoxib samples recrystallized from methanol, ethanol, and propanone.

The experimental solubility data for celecoxib in organic solvents are given in Secs. 4.2–4.8.

4.2. Celecoxib solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Hexane; C_6H_{14}; [110-54-3]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000228

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.00000924

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

4.3. Celecoxib solubility data in esters

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.828	0.172

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Butyl ethanoate; $C_6H_{12}O_2$; [123-86-4]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9920	0.00802

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

4.4. Celecoxib solubility data in ethers

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8057	0.1943

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

4.5. Celecoxib solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Tetrachloromethane; CCl_4; [56-23-5]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000554

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

4.6. Celecoxib solubility data in alcohols

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Methanol; CH_4O; [67-56-1]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9956	0.00446

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Methanol; CH_4O; [67-56-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.2988$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Ethanol; C_2H_6O; [64-17-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1661$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Ethanol; C_2H_6O; [64-17-5]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9840	0.0160

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Propanol; C_3H_8O; [71-23-8]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9833	0.0167

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 2-Propanol; C_3H_8O; [67-63-0]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9912	0.00875

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9867	0.0133

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0761$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9866	0.0134

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9932	0.00683

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9924	0.00761

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9949	0.00514

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0206$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0101$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0787$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9977	0.00227

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[66]J. Thimmasetty, C. V. S. Subrahmanyam, B. A. Vishwanath, and P. R. S. Babu, Asian J. Res. Chem. **2**, 188 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000630

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature reciprocating shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.22 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements at 251 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

4.7. Celecoxib solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.088$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

4.8. Celecoxib solubility data in binary organic solvent mixtures

Components:	**Original Measurements:**
(1) 4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl] benzenesulfonamide (Celecoxib); $C_{17}H_{14}F_3N_3O_2S$; [169590-42-5] (2) Ethanol; C_2H_6O; [64-17-5] (3) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	1.088
0.10	1.027
0.20	0.962
0.40	0.860
0.60	0.660
0.80	0.450
1.00	0.166

[a]$v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

5. Solubility of Dexibuprofen in Organic Solvents

5.1. Critical evaluation of experimental solubility data

Dexibuprofen [(S)-ibuprofen, more formally named (+)-α-methyl-4-(2-methylpropyl)benzeneacetic acid] is the more biologically active isomer of the dextrorotatory enantiomer of ibuprofen.[69–71] The majority of ibuprofen formulations on the market contain a racemic mixture of dexibuprofen [(+)-ibuprofen] and (−)-ibuprofen. Studies have shown that R-(−)-ibuprofen can be converted to S-(+)-ibuprofen in the body after oral administration.[72,73] Chiral inversion of (R)- to (S)-ibuprofen (S-IB) does not occur in the case of topical administration, however,[74] and the therapeutic anti-inflammatory effect is significantly reduced to about half of the administered dose.

There have been two experimental studies examining the solubility of dexibuprofen as a function of temperature. Zhang *et al.*[75] measured the solubility of dexibuprofen in hexane, ethanol, 1-propanol, 2-propanol, and ethyl ethanoate at several temperatures in the range of about 263 to 293 K. Wang *et al.*[76] determined dexibuprofen solubilities in five alcohol solvents (methanol, 1-butanol, 2-methyl-1-propanol, 1-pentanol, and 1-octanol) in the temperature range of 263–293 K at atmospheric pressure. The internal consistency of each individual dataset was assessed by curve-fitting the measured mole-fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 3, along with the root-mean-square deviation (RMSD) calculated according to

$$\mathrm{RMSD} = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}\left(x_1{}^{\mathrm{calc}} - x_1{}^{\mathrm{exp}}\right)^2}, \qquad (20)$$

where N is the number of experimental solubility measurements in an individual solute-solvent data set. Examination of the entries in the last column of Table 3 reveals that the largest RMSD between the back-calculated values based on Eq. (8) and experimental data is 0.003597, which translates to a relative deviation of approximately 3.5%. Results of the mathematical representation analyses indicate that the experimental data for all ten dexibuprofen–organic solvent systems are internally consistent.

The experimental solubility data for dexibuprofen in organic solvents are given in Secs. 5.2–5.4.

TABLE 3. Parameters of the Modified Apelblat equation for describing the solubility of dexibuprofen in various organic solvents

Solvent	T/K	A	B	C	RMSD
Hexane[a]	263–293	−237.371	5511.749	38.2053	0.003046
Methanol	263–293	−20.7782	115.6012	3.2054	0.001028
Ethanol[a]	263–293	−70.7086	2183.865	10.8241	0.002169
1-Propanol[a]	263–293	131.5510	−6439.273	−19.6005	0.001304
2-Propanol[a]	263–293	180.4262	−8721.97	−26.7981	0.002220
1-Butanol	263–293	−32.6572	115.3111	5.4097	0.002014
2-Methyl-1-propanol	263–293	−33.6524	115.2922	5.5811	0.001837
1-Pentanol	263–293	−32.0357	115.3343	5.3212	0.003597
1-Octanol	263–293	−29.5625	115.3966	4.9375	0.002879
Ethyl ethanoate[a]	263–293	199.6839	−9523.07	−29.6784	0.002612

[a]Numerical values of the coefficients and root-mean-square deviation were taken from Zhang *et al.*[75]

5.2. Dexibuprofen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6]
(2) Hexane; C_6H_{14}; [110-54-3]

Original Measurements:
[75]J. Zhang, L. Wang, D. Wang, J. Gong, W. Li, and J. Wang, J. Chem. Eng. Data **56**, 671 (2011).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.9697	0.0303
268.15	0.9594	0.0406
273.15	0.9453	0.0547
278.15	0.9197	0.0803
283.15	0.8841	0.1159
288.15	0.8464	0.1556
293.15	0.7896	0.2104

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

5.3. Dexibuprofen solubility data in esters

Components:
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6]
(2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]

Original Measurements:
[75]J. Zhang, L. Wang, D. Wang, J. Gong, W. Li, and J. Wang, J. Chem. Eng. Data **56**, 671 (2011).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8493	0.1507
268.15	0.8313	0.1687
273.15	0.8117	0.1883
278.15	0.7986	0.2014
283.15	0.7798	0.2202
288.15	0.7601	0.2399
293.15	0.7548	0.2452

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

5.4. Dexibuprofen solubility data in alcohols

Components:	Original Measurements:
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) Methanol; CH_4O; [67-56-1]	[76]B. Wang, L. Wang, J. Zhang, W. Li, and J. Wang, Thermochim. Acta **540**, 91 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.9162	0.0838
268.15	0.9107	0.0893
273.15	0.9070	0.0930
278.15	0.9034	0.0966
283.15	0.8952	0.1048
288.15	0.8915	0.1085
293.15	0.8871	0.1129

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) Ethanol; C_2H_6O; [64-17-5]	[75]J. Zhang, L. Wang, D. Wang, J. Gong, W. Li, and J. Wang, J. Chem. Eng. Data **56**, 671 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8758	0.1242
268.15	0.8713	0.1287
273.15	0.8609	0.1391
278.15	0.8596	0.1404
283.15	0.8459	0.1541
288.15	0.8378	0.1622
293.15	0.8309	0.1691

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 1-Propanol; C_3H_8O; [71-23-8]	[75]J. Zhang, L. Wang, D. Wang, J. Gong, W. Li, and J. Wang, J. Chem. Eng. Data **56**, 671 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8839	0.1161
268.15	0.8712	0.1288
273.15	0.8620	0.1380
278.15	0.8548	0.1452
283.15	0.8319	0.1681
288.15	0.8358	0.1642
293.15	0.8276	0.1724

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 2-Propanol; C_3H_8O; [67-63-0]	[75]J. Zhang, L. Wang, D. Wang, J. Gong, W. Li, and J. Wang, J. Chem. Eng. Data **56**, 671 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8721	0.1279
268.15	0.8559	0.1441
273.15	0.8419	0.1581
278.15	0.8306	0.1694
283.15	0.8103	0.1897
288.15	0.7988	0.2012
293.15	0.7912	0.2088

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[76]B. Wang, L. Wang, J. Zhang, W. Li, and J. Wang, Thermochim. Acta **540**, 91 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8745	0.1255
268.15	0.8627	0.1373
273.15	0.8456	0.1544
278.15	0.8366	0.1634
283.15	0.8164	0.1836
288.15	0.8012	0.1988
293.15	0.7860	0.2140

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[76]B. Wang, L. Wang, J. Zhang, W. Li, and J. Wang, Thermochim. Acta **540**, 91 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8783	0.1217
268.15	0.8668	0.1332
273.15	0.8554	0.1446
278.15	0.8400	0.1600
283.15	0.8198	0.1802
288.15	0.8075	0.1925
293.15	0.7895	0.2105

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[76]B. Wang, L. Wang, J. Zhang, W. Li, and J. Wang, Thermochim. Acta **540**, 91 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.8535	0.1465
268.15	0.8438	0.1562
273.15	0.8312	0.1688
278.15	0.8176	0.1824
283.15	0.7928	0.2072
288.15	0.7719	0.2281
293.15	0.7576	0.2424

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 99%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (+)-α-Methyl-4-(2-methylpropyl)-benzeneacetic acid ((S)-Ibuprofen; Dexibuprofen); $C_{13}H_{18}O_2$; [51146-56-6] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[76]B. Wang, L. Wang, J. Zhang, W. Li, and J. Wang, Thermochim. Acta **540**, 91 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
263.15	0.7988	0.2012
268.15	0.7828	0.2172
273.15	0.7650	0.2350
278.15	0.7425	0.2565
283.15	0.7212	0.2788
288.15	0.6929	0.3071
293.15	0.6777	0.3223

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a three-necked bottle and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) 99%, Hubei Baike Hengdi Company, China, recrystallized twice from ethanol before use.
(2) 95%, Tianjin Guangfu Chemical Reagent Company, China, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

6. Solubility of Diclofenac in Organic Solvents

6.1. Critical evaluation of experimental solubility data

Diclofenac (more formally named 2-[(2,6-dichlorophenyl) amino]benzeneacetic acid) may be administered also as the sodium or potassium salt, and is used to treat painful conditions such as arthritis, dental pain, gout, migraine, and muscle strains. There have been several published studies[60,64,77–82] involving the solubility of diclofenac in organic solvents. Barra *et al.*[77] measured the solubility of diclofenac in two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), one alkyl alkanoate (ethyl ethanoate), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N,N*-dimethylformamide) at 298 K and atmospheric pressure. The experimental results were combined with measured solubility data for sodium diclofenac and two other carboxylic acid/sodium carboxylate pairs (e.g., 4-aminobenzoic acid/sodium 4-aminobenzoate and salicylic acid/sodium salicylate) in developing a group contribution method for calculating partial solubility parameters of sodium salts. Wang and Fang[78] reported the molar solubility of diclofenac in 1-octanol, and Fini *et al.*[60] determined the molar solubility of diclofenac in 1-octanol at only three temperatures from 278 to 310 K. Wenkers and Lippold[64] published solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. Ahuja *et al.*[79] measured the solubility of diclofenac in eight refined food-grade vegetable oils (arachis oil, mustard oil, soybean oil, castor oil, olive oil, sesame oil, safflower oil, and sunflower oil) at 277 K as part of a study examining the *in vitro* corneal permeation of diclofenac from oil drops using freshly excised goat cornea.

Perlovich *et al.*[80] determined the solubility of diclofenac in both hexane and 1-octanol at five temperatures from 293 to 315 K using a spectrophotometric method of analysis. The internal consistency of the two datasets was assessed by curve-fitting the measured mole-fraction solubility data to the Modified Apelblat model [see Eq. (8)] to yield the following representations:

$$\ln x_1 = -147.424 + \frac{112.55}{T} + 23.824 \ln T, \qquad (21)$$

$$\ln x_1 = -72.984 + \frac{114.25}{T} + 11.937 \ln T, \qquad (22)$$

for solubilities in hexane and 1-octanol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (21) and (22) of 1.4% and 0.6% are less than the experimental uncertainty associated with the measured values. The mean absolute relative deviation (MARD) is defined by Eq. (23):

$$\mathrm{MARD}(\%) = \frac{100}{N} \sum \left| \frac{({x_1}^{\mathrm{exp}} - {x_1}^{\mathrm{calc}})}{{x_1}^{\mathrm{exp}}} \right|, \qquad (23)$$

where N denotes the number of experimental solubility measurements in an individual solute-solvent data set, ${x_1}^{\mathrm{exp}}$ is the experimental mole-fraction solubility, and ${x_1}^{\mathrm{calc}}$ refers to the back-calculated mole-fraction solubility.

Examination of the published solubility data reveals that 1-octanol is the only solvent for which three or more independent sets of solubility measurements at 298 K exist. The mole fraction solubility reported by Perlovich *et al.*,[80] $x_1 = 0.0101$, and by Barra *et al.*,[77] $x_1 = 0.01505$, can be converted to molar solubilities by dividing the value by the molar volume of 1-octanol, $V_{\mathrm{solvent}} = 0.15830\ \mathrm{l\,mol^{-1}}$. The calculated molar solubilities of $c_1 = 0.0638\ \mathrm{mol\,dm^{-3}}$ and $c_1 = 0.0951\ \mathrm{mol\,dm^{-3}}$ differ fairly substantially from each other, and differ also from the published values of both Wang and Fang,[78] $c_1 = 0.0835\ \mathrm{mol\,dm^{-3}}$, and Fini *et al.*,[60] $c_1 = 0.078\ \mathrm{mol\,dm^{-3}}$. Given the large variation among the four published values, no recommended value is given.

The experimental solubility data for diclofenac in organic solvents are in Secs. 6.2–6.9.

6.2. Diclofenac solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Hexane; C_6H_{14}; [110-54-3]	[80]G. L. Perlovich, A. O. Surov, L. Kr. Hansen, and A. Bauer-Brandl, J. Pharm. Sci. **96**, 1031 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9999	0.0000081
298.2	0.9999	0.0000125
303.2	0.9999	0.0000185
310.2	0.9999	0.0000310
315.2	0.9999	0.0000446

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) Purity not given, Alchemie, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Heptane; C_7H_{16}; [142-82-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000599

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000615

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.3. Diclofenac solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Benzene; C_6H_6; [71-43-2]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9973	0.00272

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.4. Diclofenac solubility data in esters

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9771	0.0229

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[81]M. A. H. M. Kamal, N. Imura, T. Nabekura, and S. Kitagawa, Chem. Pharm. Bull. **55**, 368 (2007).
Variables:	**Prepared by:**
T/K = 310	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.020$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were given in the paper. Excess solute and solvent were allowed to equilibrate at 310 K for a period of 24 h. An aliquot of the solution was removed and quickly centrifuged for 2 min. The concentration of the dissolved solute in the supernatant was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries, Osaka, Japan, purchased as the sodium salt and converted to the acidic form by addition of hydrochloric acid.
(2) Purity not given, Nascalai Tesque, Kyoto, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given in the paper to estimate.
c_1: ±10% (relative error, estimated by compiler).

6.5. Diclofenac solubility data in ethers

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9979	0.00211

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8945	0.1055

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.6. Diclofenac solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9906	0.00939

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9960	0.00403

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9963	0.00368

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.7. Diclofenac solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Methanol; CH_4O; [67-56-1]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9941	0.00587

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Ethanol; C_2H_6O; [64-17-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9913	0.00873

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9871	0.01287

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9849	0.01505

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[80]G. L. Perlovich, A. O. Surov, L. Kr. Hansen, and A. Bauer-Brandl, J. Pharm. Sci. **96**, 1031 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9916	0.0084
298.2	0.9899	0.0101
303.2	0.9877	0.0123
310.2	0.9838	0.0162
315.2	0.9808	0.0192

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The reported values represent the average of at least five determinations.

Source and Purity of Chemicals:
(1) Purity not given, Alchemie, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent Grade, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.064
298.2	0.078
310.2	0.089

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[78]M. Wang and L. Fang, Asian J. Pharm. Sci. **3**, 131 (2008).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0835$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
No experimental details were given in the paper.

Source and Purity of Chemicals:
(1) Purity not given, Tieling Tiande Pharmaceutic Company, Ltd., China, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9983	0.00170

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9951	0.00491

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[82]M.-J. Kim, H.-J. Doh, M.-K. Choi, S.-J. Chung, C.-K. Shim, D.-D. Kim, J. S. Kim, S.-S. Yong, and H.-G. Choi, Drug Delivery **15**, 373 (2008).
Variables: T/K = 310	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0562$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and a high-performance liquid chromatograph with uv detection.
Excess solute and solvent were placed in flasks and then immersed in a constant-temperature shaker bath for 24 h. Aliquots of saturated solutions were removed and filtered through a Minisart RC 4 filter of 0.45 μm pore size. Concentrations were determined by high-performance liquid chromatographic measurements at 275 nm after suitable dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Ahn-Gook Pharmaceutical Company, Seoul, South Korea, purchased as the sodium salt and converted to the free-base form by adjusting the pH and collecting the precipitate.
(2) Purity not given, HPLC grade, Merck Chemical Company, Darmstadt, Germany, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given in the paper to estimate.
c_1: ±12% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9997	0.000308

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.8. Diclofenac solubility data in ketones

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Propanone; C_3H_6O; [67-64-1]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9698	0.03020

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Acetophenone; C_8H_8O; [98-86-2]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9553	0.04473

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

6.9. Diclofenac solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9943	0.00565

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9902	0.00980

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Formamide; CH_3NO; [75-12-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9982	0.00176

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7795	0.2205

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Unique Pharmaceutical Laboratories, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0000956$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Merck Chemical Company, Darmstadt, Germany, no purification details were provided.
(2) Purity not given, Parafluid Mineralolgesellschaft, Hamburg, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Arachis oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.720$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, Amrit Banaspati Company, Ltd., Punjab, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Castor oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 1.633$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, S. D. Fine Chemical Ltd., Mumbai, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±4.0% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Mustard oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.252$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, National Diary Development Board, Gujarat, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±16% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Olive oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.291$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, SOS Cuetara, Madrid, Spain, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±10% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Safflower oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.383$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, Marico Ltd., Mumbai, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±10% (relative error).

Components:	**Original Measurements:**
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Sesame oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables:	**Prepared by:**
T/K = 277	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.325$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, Shankar Udyog, Kanpur, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±10% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Soybean oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables: T/K = 277	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.327$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, Adani Wilmar Limited, Gugarat, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±10% (relative error).

Components:	Original Measurements:
(1) 2-[(2,6-Dichlorophenyl)amino]-benzeneacetic acid (Diclofenac); $C_{14}H_{11}Cl_2NO_2$; [15307-86-5] (2) Sunflower oil	[79]M. Ahuja, S. K. Sharma, and D. K. Majumdar, Yakugaku Zasshi **127**, 1739 (2007).
Variables: T/K = 277	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.549$ (mass/volume percent).

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to pre-equilibrate at 323 K for an unspecified period of time. The solution was then cooled to 277 K and left overnight to equilibrate. The solution was subsequently centrifuged at 5000 rpm to separate the clear solution and solid material. An aliquot of the clear supernatant was dissolved in acetone and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 276 nm.

Source and Purity of Chemicals:
(1) Purity not given, prepared by the authors by acidifying sodium diclofenac (98.58%, Dabur Research Foundation, Ghaziabad, India) with dilute hydrochloric acid solution.
(2) Purity not given, Amrit Banaspati Company, Ltd., Punjab, India, was used as received.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
s_1: ±6% (relative error).

7. Solubility of Diflunisal in Organic Solvents

7.1. Critical evaluation of experimental solubility data

Diflunisal (more formally named 2′,4′-difluoro-4-hydroxy-1,1′-biphenyl-3-carboxylic acid) is a NSAID used in the treatment of mild to moderate pain from dental surgery (wisdom teeth removal) and from muscle aches and pains, and to treat symptoms of rheumatoid arthritis and osteoarthritis. There have been only four studies[64,65,83,84] involving the solubility of diflunisal in organic solvents. Perlovich *et al.*[84] determined the solubility of diflunisal in two aromatic hydrocarbons (benzene, methylbenzene), in eight linear 1-alkanols (methanol through 1-octanol), and in ethanenitrile at 298 K and atmospheric pressure. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. Rytting *et al.*[65] determined the solubility of diflunisal in polyethylene glycol 400 (PEG 400) at ambient room temperature.

Kurkov and Perlovich[83] determined the solubility of diflunisal in both hexane and 1-octanol at five temperatures from 293 to 315 K using a spectrophotometric method of analysis. The internal consistency of the two datasets was assessed by curve-fitting the measured mole fraction solubility data to the Modified Apelblat model [Eq. (8)] to yield the following representations:

$$\ln x_1 = -86.483 + \frac{113.934}{T} + 13.111 \ln T, \qquad (24)$$

$$\ln x_1 = -23.689 + \frac{115.363}{T} + 3.498 \ln T, \qquad (25)$$

for solubilities in hexane and 1-octanol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (24) and (25) of MARD = 1.2% and MARD = 1.9% are less than the experimental uncertainty associated with the measured values.

The experimental solubility data for diflunisal in organic solvents are in Secs. 7.2–7.5.

7.2. Diflunisal solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9999	0.00000900
298.2	0.9999	0.00001115
303.2	0.9999	0.00001434
310.2	0.9999	0.00001858
315.2	0.9999	0.00002247

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

7.3. Diflunisal solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) Benzene; C_6H_6; [71-43-2]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9995	0.000471

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.0% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) Methylbenzene; C_7H_8; [108-88-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9994	0.000568

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.0% (relative error).

7.4. Diflunisal solubility data in alcohols

Components:	Original Measurements:
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9849	0.0151

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9809	0.0191

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) 99.6%, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Propanol; C_3H_8O; [71-23-8]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9764	0.0236

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9734	0.0266

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9674	0.0326

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9669	0.0331

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9617	0.0383

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9648	0.0352

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9667	0.0333
298.2	0.9657	0.0343
303.2	0.9645	0.0355
310.2	0.9620	0.0380
315.2	0.9579	0.0421

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

7.5. Diflunisal solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
(2) Ethanenitrile; C_2H_3N; [75-05-8]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9964	0.00355

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, ICN Biomedicals, Aurora, Ohio, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0000675$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis.
Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, MSD, Rahway, New Jersey, USA, no purification details were provided.
(2) Purity not given, Parafluid Mineralolgesellschaft, Hamburg, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	**Original Measurements:**
(1) 2′,4′-Difluoro-4-hydroxy-1, 1′-biphenyl-3-carboxylic acid (Diflunisal); $C_{13}H_8F_2O_3$; [22494-42-4] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0466$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

8. Solubility of Etoricoxib Organic Solvents

8.1. Critical evaluation of experimental solubility data

Etoricoxib (more formally named 5-chloro-6′-methyl-3-[4-(methylsulfonyl)phenyl]-2,3′-bipyridine) is a highly selective COX-2 inhibitor. The NSAID is used in the treatment of osteoarthritis and rheumatoid arthritis, chronic back pain, and acute gout. There has been only one publication reporting the solubility of etoricoxib in organic solvents. Nayak and Panigrahi[85] examined the solubility enhancement of etoricoxib using the cosolvency method. The very low aqueous solubility of etoricoxib can cause problems in preparing drug formulations, and can limit the drug's effectiveness by delaying the rate of absorption and onset of therapeutic action. Solubilities of etoricoxib were measured in binary water + 1,2-propanediol, water + 1,2,3-propanetriol and water + polyethylene glycol 400 (PEG 400) mixtures covering the entire range of solvent composition at ambient room temperature, including the three neat organic solvents. The authors found that the solubility was significantly increased by the addition of 1,2-propanediol, 1,2,3-propanetriol and PEG 400 as cosolvents. It is not possible to perform a critical evaluation of the experimental data as measurements were made at only one temperature and there are no independent experimental solubility data for etoricoxib in these three organic solvents.

The experimental solubility data for etoricoxib in organic solvents are given in Secs. 8.2 and 8.3.

8.2. Etoricoxib solubility data in alcohols

Components:	Original Measurements:
(1) 5-Chloro-6′-methyl-3-[4-(methylsulfonyl)phenyl]-2,3′-bipyridine (Etoricoxib); $C_{18}H_{15}ClN_2O_2S$; [202409-33-4] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[85]A. K. Nayak and P. P. Panigrahi, ISRN Phys. Chem. **2012**, 820653.
Variables:	**Prepared by:**
T/K = 298 (room temperature)	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00464$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed screw cap amber color glass bottles and allowed to equilibrate at room temperature with shaking for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.22 μm membrane filter, and diluted quantitatively for spectroscopic analysis at 284 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Zydus Health Care Ltd., India, no purification details were provided.
(2) Purity not given, Qualigen Fine Chemicals, India, no purification details were provided.

Estimated Error:
Temperature: ± 1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 5-Chloro-6′-methyl-3-[4-(methylsulfonyl)phenyl]-2,3′-bipyridine (Etoricoxib); $C_{18}H_{15}ClN_2O_2S$; [202409-33-4] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[85]A. K. Nayak and P. P. Panigrahi, ISRN Phys. Chem. **2012**, 820653.
Variables:	**Prepared by:**
T/K = 298 (room temperature)	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00237$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed screw cap amber color glass bottles and allowed to equilibrate at room temperature with shaking for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.22 μm membrane filter, and diluted quantitatively for spectroscopic analysis at 284 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Zydus Health Care Ltd., India, no purification details were provided.
(2) Purity not given, Qualigen Fine Chemicals, India, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

8.3. Etoricoxib solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 5-Chloro-6′-methyl-3-[4-(methylsulfonyl)phenyl]-2,3′-bipyridine (Etoricoxib); $C_{18}H_{15}ClN_2O_2S$; [202409-33-4] (2) Polyethylene glycol 400 (PEG 400)	[85]A. K. Nayak and P. P. Panigrahi, ISRN Phys. Chem. **2012**, 820653.
Variables:	**Prepared by:**
T/K = 298 (room temperature)	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00611$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed screw cap amber color glass bottles and allowed to equilibrate at room temperature with shaking for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.22 μm membrane filter, and diluted quantitatively for spectroscopic analysis at 284 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Zydus Health Care Ltd., India, no purification details were provided.
(2) Purity not given, Qualigen Fine Chemicals, India, no purification details were provided.

Estimated Error:
Temperature: ± 1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

9. Solubility of Fenbufen in Organic Solvents

9.1. Critical evaluation of experimental solubility data

Fenbufen [more formally named 3-(4-biphenylcarbonyl)-propionic acid] is a nonselective NSAID and has been used to treat pain and inflammation associated with musculoskeletal and joint disorders. Fenbufen has been used successfully to alleviate symptoms in individuals suffering with tendinitis and

periarthritis of the shoulder, acute gout, and fibrositis (inflammation of fibrous tissue). There have been three publications[60,65,83] reporting the solubility of fenbufen in organic solvents. Fini *et al.*[60] determined the molar solubility of fenbufen in 1-octanol at only three temperatures from 278 to 310 K. Kurkov and Perlovich[83] measured the mole fraction solubility of fenbufen in hexane as a function of temperature from 303 to 315 K, and in 1-octanol from 293 to 315 K. Rytting *et al.*[65] reported the molar solubility of fenbufen in polyethylene glycol 400 (PEG 400) at ambient room temperature. The internal consistency of the Ref. 83 datasets was assessed by curve-fitting the measured mole-fraction solubility data to the Modified Apelblat model [see Eq. (8)] to yield the following representations:

$$\ln x_1 = -143.936 + \frac{110.88}{T} + 22.718 \ln T, \qquad (26)$$

$$\ln x_1 = -102.395 + \frac{111.83}{T} + 16.746 \ln T, \qquad (27)$$

for solubilities in hexane and 1-octanol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (26) and (27) of MARD = 2.3% and MARD = 2.4% are comparable in magnitude to the experimental uncertainty associated with the measured values.

The experimental solubility data for fenbufen in organic solvents are given in Secs. 9.2–9.4.

9.2. Fenbufen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 3-(4-Biphenylcarbonyl)propionic acid (Fenbufen); $C_{16}H_{14}O_3$; [36330-85-5] (2) Hexane; C_6H_{14}; [110-54-3]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
303.2	0.9999	0.00000104
305.2	0.9999	0.00000126
308.2	0.9999	0.00000153
310.2	0.9999	0.00000185
313.2	0.9999	0.00000224
315.2	0.9999	0.00000246

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, Oslo, Norway, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

9.3. Fenbufen solubility data in alcohols

Components:	**Original Measurements:**
(1) 3-(4-Biphenylcarbonyl)propionic acid (Fenbufen); $C_{16}H_{14}O_3$; [36330-85-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9989	0.00106
298.2	0.9987	0.00129
303.2	0.9982	0.00178
310.2	0.9973	0.00266
315.2	0.9967	0.00332

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, Oslo, Norway, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-(4-Biphenylcarbonyl)propionic acid (Fenbufen); $C_{16}H_{14}O_3$; [36330-85-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.005
298.2	0.012
310.2	0.019

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

9.4. Fenbufen solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 3-(4-Biphenylcarbonyl)propionic acid (Fenbufen); $C_{16}H_{14}O_3$; [36330-85-5]	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0986$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

10. Solubility of Fentiazac in Organic Solvents

10.1. Critical evaluation of experimental solubility data

Fentiazac [more formally named 4-(4-chlorophenyl)-2-phenyl-5-thiazoleacetic acid] is a NSAID that exhibits analgesic and anti-inflammatory properties in controlling disease activity associated with rheumatoid arthritis. There has been only a single publication reporting the solubility of fentiazac in organic solvents. Fini *et al.*[60] determined the molar solubility of fentiazac in 1-octanol at only three temperatures from 278 to 310 K. It is not possible to perform a critical evaluation of the experimental data as measurements were made at too few temperatures to permit a meaningful linear regression analysis, and there are no independent experimental solubility data for fentiazac in 1-octanol.

The experimental solubility data for fentiazac in 1-octanol are given in Sec. 10.2.

10.2. Fentiazac solubility data in alcohols

Components:	Original Measurements:
(1) 4-(4-Chlorophenyl)-2-phenyl-5-thiazoleacetic acid (Fentiazac); $C_{17}H_{12}ClNO_2S$; [18046-21-4]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.113
298.2	0.170
310.2	0.223

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

11. Solubility of Flufenamic Acid in Organic Solvents

11.1. Critical evaluation of experimental solubility data

Flufenamic acid (more formally named 2-[[3-(trifluoromethyl)phenyl]amino]benzoic acid) is a NSAID that is administered both orally and topically in the treatment of pain and inflammation associated with musculoskeletal and joint disorders. There have been several publications[64,65,86–89] reporting the solubility of flufenamic acid in organic solvents. Lee *et al.*[88] determined the solubility of flufenamic acid in cyclohexane, methylbenzene, and ethanol at 298 K and atmospheric pressure using a high-performance liquid chromatographic method of analysis. The measurements were performed as part of a larger study that examined the effect that a cosolute had on the solubility of the main solute. In this particular study, flufenamic acid served as the cosolute and mefenamic acid was the main drug solute. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. Rytting *et al.*[65] determined the solubility of flufenamic acid in polyethylene glycol 400 (PEG 400) at ambient room temperature.

There have been three experimental studies reporting how the solubility of flufenamic acid varied with temperature. Surov *et al.*[86] and Perlovich *et al.*[87] both examined the solubility of flufenamic acid in hexane and 1-octanol. Domańska *et al.*[89] measured flufenamic acid solubilities in ethanol and 1-octanol using a dynamic method that recorded the temperature at which the last crystals of the solid solute disappeared. The internal consistency of the six datasets was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 4, along with the mean absolute relative deviation. Each of the six data sets is considered internally consistent as evidenced by the small MARD values.

TABLE 4. Parameters of the Modified Apelblat equation for describing the solubility of flufenamic acid in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Hexane[a]	293–315	−113.190	113.325	18.517	0.5
Hexane[b]	293–315	−113.295	113.325	17.915	1.2
Ethanol[c]	299–322	−53.857	114.658	8.905	2.0
1-Octanol[a]	293–315	−53.992	18.719	9.043	1.6
1-Octanol[b]	293–315	−53.752	18.719	9.001	1.0
1-Octanol[c]	287–347	−46.094	18.887	7.651	1.6

[a]Data set from Surov *et al.*[86]
[b]Data set from Perlovich *et al.*[87]
[c]Data set from Domańska *et al.*[89]

The experimental solubility data for flufenamic acid in organic solvents are given in Secs. 11.2–11.5.

11.2. Flufenamic acid solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9]	[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9995	0.000492
298.2	0.9993	0.000674
303.2	0.9991	0.000910
310.2	0.9986	0.001385
315.2	0.9982	0.001824

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Hexane; C_6H_{14}; [110-54-3]	[87]G. L. Perlovich, A. O. Surov, and A. Bauer-Brandl, J. Pharm. Biomed. Anal. **45**, 679 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9999	0.0000145
298.2	0.9999	0.0000198
303.2	0.9999	0.0000259
310.2	0.9999	0.0000399
315.2	0.9999	0.0000512

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid; (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9987	0.001265

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

11.3. Flufenamic acid solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Methylbenzene; C_7H_8; [108-88-3]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9713	0.0287

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Mallinckrodt Baker, Inc., Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

11.4. Flufenamic acid solubility data in alcohols

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Ethanol; C_2H_6O; [64-17-5]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9507	0.0493

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Pharmco, Brookfield, Connecticut, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Ethanol; C_2H_6O; [64-17-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298.8	0.9313	0.0687
301.2	0.9298	0.0702
303.0	0.9256	0.0744
306.9	0.9232	0.0768
309.1	0.9125	0.0875
311.4	0.9064	0.0936
314.3	0.8958	0.1042
318.4	0.8846	0.1154
322.3	0.8750	0.1250

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/ h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
287.4	0.9325	0.0675
295.4	0.9178	0.0822
303.4	0.9040	0.0960
307.7	0.8927	0.1073
310.7	0.8806	0.1194
314.6	0.8679	0.1321
318.9	0.8539	0.1461
322.1	0.8387	0.1613
328.9	0.8174	0.1826
329.5	0.8117	0.1883
340.7	0.7683	0.2317
347.5	0.7404	0.2596

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[87]G. L. Perlovich, A. O. Surov, and A. Bauer-Brandl, J. Pharm. Biomed. Anal. **45**, 679 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9228	0.0772
298.2	0.9080	0.0920
303.2	0.8970	0.1030
310.2	0.8720	0.1280
315.2	0.8510	0.1490

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Sigma Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9238	0.0762
298.2	0.9067	0.0933
303.2	0.8969	0.1031
310.2	0.8727	0.1273
315.2	0.8509	0.1491

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Sigma Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

11.5. Flufenamic acid solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00338$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sankyo, Pfaffenhofen, Germany, no purification details were provided.
(2) Purity not given, Parafluid Mineralolgesellschaft, Hamburg, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]benzoic acid (Flufenamic acid); $C_{14}H_{10}F_3NO_2$; [530-78-9]	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0843$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

12. Solubility of Flurbiprofen in Organic Solvents

12.1. Critical evaluation of experimental solubility data

Flurbiprofen (more formally named 2-(2-fluoro-4-biphenyl)propionic acid) is a NSAID currently used in pain treatment therapies for individuals suffering with arthritis. The drug is administered as a racemic mixture; however, the (S)-enantiomer exhibits by far the higher anti-inflammatory activity, which is reported to be 30 times larger than the activity of the racemic mixture.[90] There are several published studies[60,65,83,84,91,92] involving the solubility of flurbiprofen in organic solvents. Most notably, Perlovich *et al.*[84] measured the mole-fraction solubility of flurbiprofen dissolved in 22 different organic solvents, including four saturated hydrocarbons (pentane, hexane, heptane and octane), two aromatic hydrocarbons (benzene and methylbenzene), one alkyl alkanoate (ethyl ethanoate), one cyclic ether (1,4-dioxane), eight primary alcohols (methanol, ethanol, 1-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, and 1-octanol), one alkanone (propanone), and one miscellaneous organic solvent (ethanenitrile) at 298 K and atmospheric pressure. Larsen *et al.*[92] determined the solubility of flurbiprofen in castor oil at 310 K, while Rytting *et al.*[65] measured the solubility in polyethylene glycol 400 (PEG 400) at ambient room temperature.

There have been three studies[60,83,91] reporting the solubility of flurbiprofen as a function of temperature. Fini *et al.*[60] determined the molar solubility of flurbiprofen in 1-octanol at only three temperatures from 278 to 310 K. Kurkov and Perlovich[83] examined the solubility of flurbiprofen in both hexane and 1-octanol between 293 and 315 K using a spectrophotometric method. Domańska *et al.*[91] measured the mole-fraction solubility of flurbiprofen in ethanol and 1-octanol by slowly increasing the solution temperature until the last crystal dissolved. The internal consistency of the latter four datasets was assessed by curve-fitting the measured mole-fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 5, along with the mean absolute relative deviation. Each of the four data sets is considered internally consistent as evidenced by the small MARD values. There were insufficient experimental measurements in the Fini *et al.*[60] dataset to obtain a meaningful regression analysis.

The experimental solubility data for flurbiprofen in organic solvents are given in Secs. 12.2–12.8.

TABLE 5. Parameters of the Modified Apelblat equation for describing the solubility of flurbiprofen in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Hexane[a]	293–315	−138.581	112.751	2.907	3.8
Ethanol[b]	299–322	−69.962	114.290	11.772	3.3
1-Octanol[a]	291–303	−41.740	114.963	6.795	0.9
1-Octanol[b]	300–336	−65.387	114.447	10.968	2.1

[a]Data set of Kurkov and Perlovich.[83]
[b]Data set of Domańska *et al.*[91]

12.2. Flurbiprofen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Pentane; C_5H_{12}; [109-66-0]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9996	0.000350

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Hexane; C_6H_{14}; [110-54-3]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9995	0.000494

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Hexane; C_6H_{14}; [110-54-3]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9997	0.000328
298.2	0.9996	0.000443
303.2	0.9993	0.000666
310.2	0.9989	0.001059
315.2	0.9983	0.001691

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Heptane; C_7H_{16}; [142-82-5]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9994	0.000631

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Octane; C_8H_{18}; [111-65-9]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9994	0.000616

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

12.3. Flurbiprofen solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Benzene; C_6H_6; [71-43-2]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9318	0.0682

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Methylbenzene; C_7H_8; [108-88-3]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9233	0.0767

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Germany Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

12.4. Flurbiprofen solubility data in esters

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8890	0.1110

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.0% (relative error).

12.5. Flurbiprofen solubility data in ethers

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8250	0.1750

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.0% (relative error).

12.6. Flurbiprofen solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Methanol; CH_4O; [67-56-1]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9522	0.0478

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Ethanol; C_2H_6O; [64-17-5]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9388	0.0612

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) 99.6%, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Ethanol; C_2H_6O; [64-17-5]	[91]U. Domańska, A. Pobudkowska, A. Pelczarska, and P. Gierycz, J. Phys. Chem. B **113**, 8941 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
299.1	0.9216	0.0784
301.2	0.9100	0.0900
303.9	0.8952	0.1048
306.7	0.8863	0.1137
308.4	0.8752	0.1248
311.3	0.8633	0.1367
313.7	0.8495	0.1505
316.1	0.8403	0.1597
319.8	0.8246	0.1754
322.1	0.8125	0.1875

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath and an analytical balance.
Solubility was measured using a dynamic synthetic method. Known amounts of solute and solvent were placed in Pyrex glass containers and allowed to equilibrate in a thermostated water bath. The temperature of the bath was slowly increased and the temperature at which the last crystal disappeared was recorded as the solid-liquid equilibrium temperature.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, USA, stored over freshly activated molecular sieves before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Propanol; C_3H_8O; [71-23-8]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9332	0.0668

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9333	0.0667

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9284	0.0716

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9284	0.0716

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9240	0.0760

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9183	0.0817

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[83]S. V. Kurkov and G. L. Perlovich, Int. J. Pharm. **357**, 100 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
291.2	0.9392	0.0608
293.2	0.9350	0.0650
298.2	0.9294	0.0706
303.2	0.9204	0.0796

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, centrifuge, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature. An aliquot of the saturated solution was removed, centrifuged to remove suspended particulate material, and diluted quantitatively for spectroscopic analyses. The reported values represent the average of at least four determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.232
298.2	0.286
310.2	0.332

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[91]U. Domańska, A. Pobudkowska, A. Pelczarska, and P. Gierycz, J. Phys. Chem. B **113**, 8941 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
300.4	0.9165	0.0835
305.6	0.8928	0.1072
311.3	0.8662	0.1338
317.4	0.8398	0.1602
322.8	0.8097	0.1903
327.9	0.7766	0.2234
332.5	0.7452	0.2548
336.4	0.7132	0.2868

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath and an analytical balance.
Solubility was measured using a dynamic synthetic method. Known amounts of solute and solvent were placed in Pyrex glass containers and allowed to equilibrate in a thermostated water bath. The temperature of the bath was slowly increased and the temperature at which the last crystal disappeared was recorded as the solid-liquid equilibrium temperature.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, USA, stored over freshly activated molecular sieves before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error, estimated by compiler).

12.7. Flurbiprofen solubility data in ketones

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Propanone; C_3H_6O; [67-64-1]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.876	0.124

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.0% (relative error).

12.8. Flurbiprofen solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Ethanenitrile; C_2H_3N; [75-05-8]	[84]G. L. Perlovich, S. V. Kurkov, and A. Bauer-Brandl, Eur. J. Pharm. Sci. **19**, 423 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9692	0.0308

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Castor oil	[92]D. B. Larsen, H. Parshad, K. Fredholt, and C. Larsen, Int. J. Pharm. **232**, 107 (2002).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 0.400$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped test tube and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, centrifuged at 15 000 rpm for 10 min, and diluted quantitatively with ethanol for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2-Fluoro-4-biphenyl)propionic acid ((±) Flurbiprofen); $C_{15}H_{13}FO_2$; [5104-49-4] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.265$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

13. Solubility of Ibuprofen in Organic Solvents

13.1. Critical evaluation of experimental solubility data

Ibuprofen (more formally named α-methyl-4-(2-methylpropyl)benzeneacetic acid) is a popular NSAID used for fever reduction and to treat inflammation and pain caused by arthritis, headache, toothache, and minor injury. There are several published studies[60,65,93–117] involving the solubility of ibuprofen in organic solvents. Most notably, Bustamante *et al.*[93] examined the solubility of ibuprofen in two saturated hydrocarbons (heptane and cyclohexane), in one aromatic hydrocarbon (benzene), in one alkyl alkanoate (ethyl ethanoate), in one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), in two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), in seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), in one alkanone (propanone) and one aromatic ketone (acetophenone), and in

four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Perlovich *et al.*[102] determined the solubility of ibuprofen in eight 1-alkanols (methanol through 1-octanol) based on spectrophotometric measurements. Stovall *et al.*[103] also used spectroscopic methods to measure the solubility of ibuprofen in six primary linear alcohols (methanol, ethanol, 1-propanol, 1-pentanol, 1-octanol, and 1-decanol), in two secondary alcohols (2-propanol and 2-butanol), and in one branched primary alcohol (2-methyl-1-propanol) at 298 K and atmospheric pressure. Garzón and Martínez,[94] Aragón *et al.*,[101] Wang *et al.*,[97] Soltanpour and Jouyban,[109,110] Jouyban *et al.*,[108] Wang *et al.*,[105] Manrique and Martínez,[107] and Manrique *et al.*[111] have also performed ibuprofen solubility measurements at 298 K. Takahashi *et al.*[100] measured the solubility of ibuprofen in diethyl butanedioate, diethyl hexanedioate, diisopropyl hexanedioate, and diethyl decanedioate at 305 K in their study concerning the use of fatty diesters as a means to enhance NSAID permeation through skin.

The Abraham solvation parameter model can provide an indication of the quality of experimental solubility data for ibuprofen dissolved in a series of organic solvents of varying polarity and hydrogen bonding character. As discussed in Sec. 1.3, the evaluation will be restricted to those solvents where dimerization is not likely to occur and to solvents where ibuprofen does not form a solid solvate. Expressions based on the Abraham model have been shown to provide reasonably accurate mathematical correlations for the solubility behavior of numerous crystalline nonelectrolyte solutes, with deviations between observed and calculated values on the order of 0.15 $\log_{10}$ units or less. The Abraham model is based on two linear free energy relationships that describe solute transfer to organic solvents from water and from the gas phase. Expressed in terms of molar solubility, the linear free energy relationships take the following forms:

$$\log_{10}\left(c_{1,S}^{sat}/c_{1,W}^{sat}\right) = c_p + e_p \cdot E + s_p \cdot S + a_p \cdot A + b_p \cdot B + v_p \cdot V, \quad (28)$$

$$\log_{10}\left(c_{1,S}^{sat}/c_{1,G}\right) = c_k + e_k \cdot E + s_k \cdot S + a_k \cdot A + b_k \cdot B + l_k \cdot L, \quad (29)$$

where $c_{1,S}^{sat}$ and $c_{1,W}^{sat}$ are the molar solubilities of the solute in the organic solvent and in water, respectively, and $c_{1,G}$ is the molar concentration of the solute in the gas phase. The molar concentrations are expressed in units of mol dm^{-3}. For notational simplicity, the "sat" superscript will be dropped in subsequent discussions, and the quantities simply denoted as c_1 and $c_{1,W}$. The Abraham model solvent equation coefficients that are given in Tables 1 and 2 pertain to 298 K unless otherwise noted. For a given solute–solvent system, Eqs. (28) and (29) give calculated c_1 values that differ from one another by only a few hundredths of a logarithmic unit.

Stovall *et al.*[103] used their measured solubility data for ibuprofen in ethyl ethanoate, 1,1′-oxybisethane, and nine alcohol solvents, combined with published solubility and partition coefficient data, to calculate the Abraham solute descriptors of ibuprofen. The authors were able to assemble a total of 50 $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) equations for which experimental partition coefficient data, solubility ratios, chromatographic retention times, Abraham Model equation coefficients, and aqueous molar solubility were available. The logarithm of the aqueous molar solubility of ibuprofen is $\log_{10}c_{1,W} = -3.76$.[118,119] The McGowan volume of ibuprofen, $V = 1.7771$, was calculated from the number of chemical bonds in the molecule and the individual atomic group volumes, AV_i, given in Sec. 1.3. The excess molar refraction solute descriptor was estimated as $E = 0.730$. This left four solute descriptors (S, A, B, and L) still to be determined. The 50 equations were then solved using the Microsoft "SOLVER" program to yield values of the remaining four solute descriptors, $S = 0.695$, $A = 0.565$, $B = 0.790$, and $L = 7.184$, that best described the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) values. The computation treated $\log_{10}c_{1,G}$ as a floating parameter to be determined as part of the regression analyses. The data analyses returned a value of $\log_{10}c_{1,G} = -9.460$ for the logarithm of the gas-phase solute concentration that made the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) predictions internally consistent. The calculated molecular solute descriptors reproduced the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) values to within an average standard deviation of 0.109 and 0.114 $\log_{10}$ units, respectively.

Table 6 compares the experimental $\log_{10}c_1$ values to calculated values based on Eqs. (28) and (29) of the Abraham model. For comparison purposes, the measured mole fraction solubilities of ibuprofen, x_1, determined by Stovall *et al.*[103] were converted into molar solubilities by dividing x_1 by the ideal molar volume of the saturated solution (i.e., $c_1^{sat} = x_1/[x_1V_1 + (1-x_1)V_{solvent}]$. The molar volume of the hypothetical subcooled liquid ibuprofen is $V_{solute} = 208.0$ $cm^3\,mol^{-1}$. Examination of the numerical entries in Table 6 reveals that the Abraham model provides a reasonably accurate mathematical description for much of the observed solubility.

Solution models, like the Abraham solvation parameter model, prove useful in screening datasets for obvious outliers, particularly in cases where there are only one or two experimental data points for a given solute-solvent system. Such models are only able to identify those outliers, however, which fall outside of the model's expected predictive applicability. One does need to carefully look at the individual replicate measurements as examinations can provide useful information. The numerical entries in Table 6 further show that there is considerable variation in the experimental solubility of ibuprofen determined by independent research groups for several organic solvents. Part of the variation may be due to differences in chemical purities and to the different experimental methodologies employed by the various researchers. Published studies[120–122] have reported the existence of two polymorphic forms of racemic ibuprofen. The first discovered polymorph (Form I) has a melting-point temperature of 349 K, and the crystal structure was first reported by McConnell in 1974.[120] The second polymorph (Form II) was discovered through differential scanning calorimetry (DSC) experiments[121] where a molten racemic ibuprofen sample was quenched rapidly to 143 K, and then held at this temperature

TABLE 6. Comparison between observed and predicted molar solubilities of ibuprofen based on the Abraham model, Eqs. (28) and (29)

Solvent	$\log_{10}c_1^{calc}$; Eq. (28)	$\log_{10}c_1^{calc}$; Eq. (29)	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$
Methanol	−0.071	−0.061	0.070[a]		
Ethanol	0.285	0.166	0.070[a]	0.069[b]	0.250[c]
			0.343[d]	0.360[e]	0.359[f]
1-Propanol	0.259	0.165	0.180[a]	0.179[b]	0.311[d]
2-Propanol	0.258	0.215	0.330[b]	0.321[d]	
1-Butanol	0.176	0.309	0.160[a]	0.165[b]	0.272[d]
2-Butanol	0.080	0.105	0.246[a]		
2-Methyl-1-propanol	0.206	0.222	0.239[a]	0.237[d]	
2-Methyl-2-propanol	0.180	0.243			
1-Pentanol	0.308	0.267	0.160[a]	0.079[b]	0.216[c]
			0.230[d]		
2-Pentanol	0.386	0.278			
3-Methyl-1-butanol	0.357	0.147	0.219[d]		
1-Hexanol	0.218	0.127	0.190[b]		
1-Heptanol	0.280	0.246	0.160[b]		
1-Octanol	−0.025	−0.019	0.070[a]	0.071[b]	0.114[c]
			0.291[g]	−1.041[h]	
1-Decanol	0.175	0.086	0.045[a]		

[a]Experimental value from Stovall *et al.*[103]
[b]Experimental value from Perlovich *et al.*[102]
[c]Experimental value from Bustamante *et al.*[93]
[d]Experimental value from Wang *et al.*[97]
[e]Experimental value from Manríque and Martínez.[107]
[f]Experimental value from Soltanpour and Jouyban.[109]
[g]Experimental value from Garzón and Martínez.[94]
[h]Experimental value from Fini *et al.*[60]

for a period of time, followed by annealing at 258 K. Form II has a much lower melting-point temperature of 290 K, and its crystal structure is indeed different than that of Form I.[122] A metastable amorphous form of racemic ibuprofen is also known, with a glass-transition temperature of 228 K.[123] Polymorphism could explain some of the observed differences; however, the experimental conditions employed in normal solubility measurements are far removed from the low-temperature quenching conditions used in producing Form II. It is noted that the samples of ibuprofen used in the solubility studies did come from different chemical suppliers, and there is no way of knowing how the various samples were synthesized and purified prior to use.

While polymorphism cannot be definitively ruled out, a more likely explanation for the large variation in the measured solubilities of ibuprofen in a given solvent might be differences in crystallinity. Lee *et al.*[124] performed calorimetric studies on acetaminophen and ibuprofen samples recrystallized from different solvent media. The authors calculated the percent crystallinity as

$$\%\text{Crystallinity} = \frac{\text{Area of sample melting peak}}{\text{Area of standard melting peak}}, \quad (30)$$

which is the ratio of the area of the sample melting peak divided by the area of a standard ibuprofen sample having a high degree of crystallinity. The percent crystallinity varied with recrystallization solvent, from a value of 100% for a sample recrystallized from *N*,*N*-dimethylformamide to a low value of 14.3% crystallinity for a sample crystallized from tetrahydrofuran. There was no information given in the paper concerning the reproducibility of an individual solvent value. In general the solubility would increase with decreased percent crystallinity. The authors further noted that ibuprofen did not crystallize from supersaturated solutions of benzenemethanol, dimethylbenzene, acetone or dimethyl sulfoxide. Csoka[125] had earlier reported that ibuprofen recrystallized from various solvents showed different solubilities in water.

There have been several studies[60,91,94,96,101,104,107,111] reporting the solubility of ibuprofen as a function of temperature. Fini *et al.*[60] determined the molar solubility of ibuprofen in 1-octanol at only three temperatures from 278 to 310 K. Garzón and Martínez[94] measured the solubility of ibuprofen in cyclohexane, 1-methylethyl tetradecanoate, trichloromethane and 1-octanol at several temperatures from 293 to 313 K. Aragón *et al.*[101] examined the solubility of ibuprofen in dichloromethane and propanone in the temperature range of 293–313 K. Manrique and co-workers[107,111] reported solubility data for ibuprofen in ethanol and 1,2-propanediol at several temperatures between 293 and 313 K. Gracin and Rasmuson[96] employed a gravimetric method to study the solubility of ibuprofen in methylbenzene, ethyl ethanoate, methanol, ethanol, 2-propanol, propanone, and 4-methyl-2-pentanone. Domańska *et al.*[91] determined the solubility of ibuprofen in ethanol and 1-octanol at as a function of temperature using a dynamic method that involved placing known amounts of solute and solvent in sealed containers and slowly increasing the temperature until the last crystal disappeared. Finally, Wang *et al.*[97] studied the solubility of ibuprofen in nine organic solvents (ethyl ethanoate, ethanol, 1-propanol,

TABLE 7. Parameters of the Modified Apelblat equation for describing the solubility of ibuprofen in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Cyclohexane[a]	298–313	17.730	−5943.49		6.0
Methylbenzene[b]	283–308	−72.791	−1.602	12.496	1.9
Ethyl ethanoate[b]	283–308	−66.983	−1.463	11.494	0.4
Ethyl ethanoate[c]	283–318	136.171	−8863.89	−18.940	0.2
2-Methylethyl tetradecanoate[a]	298–313	12.253	−4167.98		1.6
Dichloromethane[d]	293–313	−36.543	−0.761	6.190	0.7
Trichloromethane[a]	298–313	10.618	−3461.35		0.2
Methanol[b]	283–308	−71.638	−1.574	12.278	5.5
Ethanol[b]	283–308	−68.545	−1.496	11.759	4.5
Ethanol[c]	283–318	0.2894	−2605.96	1.1978	0.6
Ethanol[e]	297–330	−58.237	−4.902	9.919	1.3
Ethanol[f]	293–313	−53.740	−1.147	9.183	1.9
1-Propanol[c]	283–318	−15.748	−1913.22	3.6161	0.4
2-Propanol[b]	283–308	−63.612	114.474	10.835	1.9
2-Propanol[c]	283–318	105.804	−7348.47	−14.508	0.6
1-Butanol[c]	283–318	−53.514	−158.355	9.2210	0.7
2-Methyl-1-propanol[c]	283–318	67.904	−5987.66	−8.6743	0.4
1-Pentanol[c]	283–318	−31.136	−1205.96	5.9119	0.4
3-Methyl-1-butanol[c]	283–318	87.427	−6682.55	−11.682	0.2
1-Octanol[a]	298–313	13.752	−4418.37		0.6
1-Octanol[e]	297–339	−54.166	−4.816	9.240	1.2
1,2-Propanediol[g]	293–313	−98.356	−2.156	16.862	4.4
Propanone[b]	283–308	−59.341	114.577	10.093	0.4
Propanone[c]	283–318	91.530	−6480.52	−12.505	0.5
Propanone[d]	293–313	−46.665	−0.971	7.961	0.8
4-Methyl-2-pentanone[b]	283–308	−62.727	114.506	10.681	0.4

[a]Data set of Garzón and Martínez.[94]
[b]Data set of Gracin and Rasmuson.[96]
[c]Values of the equation coefficients were taken from Wang *et al.*[97]
[d]Data set of Aragón, Rosas and Martínez.[101]
[e]Data set of Domańska *et al.*[91]
[f]Data set of Manrique and Martínez.[107]
[g]Data set of Manrique *et al.*[111]

2-propanol, 1-butanol, 2-methyl-1-propanol, 1-pentanol, 3-methyl-1-butanol, and propanone) by incrementally small amounts of the solute until no further solid dissolved. The dissolution of the solid was observed using laser monitoring. The internal consistency of the 26 datasets was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (*A*, *B*, and *C*) are given in Table 7, along with the mean absolute relative deviation. Each of the data sets is considered internally consistent as evidenced by the small MARD values. There were insufficient experimental measurements in the Fini *et al.*[60] dataset to obtain a meaningful regression analysis.

The experimental solubility data for ibuprofen in organic solvents are given in Secs. 13.2–13.10.

13.2. Ibuprofen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]
(2) Heptane; C_7H_{16}; [142-82-5]

Original Measurements:
[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9440	0.05598

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8479	0.1521

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[94]L. C. Garzón and F. Martínez, J. Solution Chem. **33**, 1379 (2004).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298.15	0.8878	0.1122
303.15	0.8440	0.1560
308.15	0.8072	0.1928
313.15	0.6975	0.3025

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker, constant-temperature water bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered glass flask and stirred in a mechanical shaker for 1 h. The flasks were then transferred to a constant-temperature bath where the solution equilibrated for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analysis. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the molar solubilities given in mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, UPS, Mallinckrodt, USA, no purification details were given in the paper.
(2) Purity not given, F.A. grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.689$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

13.3. Ibuprofen solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Benzene; C_6H_6; [71-43-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9153	0.08472

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Toluene; C_7H_8; [108-88-3]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8966	0.1034
288.15	0.8671	0.1329
293.15	0.8304	0.1696
303.15	0.7491	0.2509
308.15	0.7006	0.2994

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

13.4. Ibuprofen solubility data in esters

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.6652	0.3348

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8774	0.1226
288.15	0.8495	0.1505
293.15	0.8150	0.1850
303.15	0.7322	0.2678
308.15	0.6738	0.3262

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.17	0.8733	0.1267
288.47	0.8416	0.1584
293.57	0.8065	0.1935
297.69	0.7746	0.2254
302.75	0.7287	0.2713
307.83	0.6805	0.3195
313.07	0.6238	0.3762
318.45	0.5612	0.4388

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[98]K. H.-Y. Hsi, K. Chadwick, A. Fried, M. Kenny, and A. S. Myerson, Cryst. Eng. Comm. **14**, 2386 (2012).
Variables:	**Prepared by:**
T/K = 293	W. E. Acree, Jr.

Experimental Values

The authors studied the separation of impurities from solution by selective co-crystal formation. Solubilities of ibuprofen and the ibuprofen-4,4′-bipyridine co-crystal. Ethyl ethanoate was chosen because both ibuprofen (IBU) and 4,4′-bipyridine were both moderately soluble in the organic solvent. The statement in the paper regarding the solubility of ibuprofen was "the solubility of IBU was reduced by a factor of 8 from 478.6 mg g^{-1} to 57.6 mg g^{-1} by forming the BIPY cocrystal". The reported solubility is $s_1 = 478.6$ mg g^{-1}; however the authors did not specify whether the solubility was per gram of organic solvent or per gram of saturated solution.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were provided in the paper. The authors state that the solubility was determined using a Thermofisher Clarity solubility station, and reference a published paper by [Y. Yi, D. Hatziavramidis, and A. S. Myerson, Ind. Eng. Chem. Res. **44**, 5427 (2005)].

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given in the paper.
s_1: Insufficient information given in the paper.

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[94]L. C. Garzón and F. Martínez, J. Solution Chem. **33**, 1379 (2004).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298.15	0.8251	0.1749
303.15	0.7718	0.2282
308.15	0.7160	0.2840
313.15	0.6581	0.3419

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker, constant-temperature water bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered glass flask and stirred in a mechanical shaker for 1 h. The flasks were then transferred to a constant-temperature bath where the solution equilibrated for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analysis. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the molar solubilities given in mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, UPS, Mallinckrodt, USA, no purification details were given in the paper.
(2) Purity not given, F.S. grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[99]B. S. Makhmalzadeh, S. Torabi, and A. Azarpanah, Iranian J. Pharm. Res. **11**, 47 (2010).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.950$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped test tube and allowed to equilibrate at ambient room temperature for 24 h. Aliquots of saturated solutions were removed, centrifuged at 3000 rpm for 10 min, filtered, and then diluted quantitatively for high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Caspian Tamin, Rashat, Iran, no purification details were provided.
(2) Purity not given, Panreac, Spain, no purification details were provided.

Estimated Error:
Temperature: Insufficient information given in the paper to estimate.
c_1: ±15% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Diethyl butanedioate; $C_8H_{14}O_4$; [123-25-1]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.453$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Diethyl hexanedioate; $C_{10}H_{18}O_4$; [141-28-6]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.453$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Diisopropyl hexanedioate; $C_{12}H_{22}O_4$; [6938-94-9]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.223$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Diethyl decanedioate; $C_{14}H_{26}O_4$; [110-40-7]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.389$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

13.5. Ibuprofen solubility data in ethers

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9778	0.02223

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9628	0.03719

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

13.6. Ibuprofen solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Dichloromethane; CH_2Cl_2; [75-09-2]	[101]D. M. Aragón, J. E. Rosas, and F. Martínez, Brazil. J. Pharm. Sci. **46**, 227 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.7238	0.2762
298.15	0.6979	0.3021
303.15	0.6617	0.3383
308.15	0.6207	0.3793
313.15	0.5893	0.4107

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7462	0.2538

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[94]L. C. Garzón and F. Martínez, J. Solution Chem. **33**, 1379 (2004).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298.15	0.629	0.371
303.15	0.550	0.450
308.15	0.461	0.539
313.15	0.352	0.648

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker, constant-temperature water bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered glass flask and stirred in a mechanical shaker for 1 h. The flasks were then transferred to a constant-temperature bath where the solution equilibrated for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analysis. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the molar solubilities given in mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, UPS, Mallinckrodt, USA, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, Mallinckrodt, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.7907	0.2093
288.15	0.7571	0.2429
293.15	0.7283	0.2717

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9141	0.08587

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9799	0.02013

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

13.7. Ibuprofen solubility data in alcohols

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9753	0.02468

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9399	0.0601

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9395	0.06053

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99.8%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.9943
290.65	1.0208
293.15	1.1172
295.65	1.2905
298.15	1.4206

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.10 μm membrane filter, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, no purification details were provided in the paper.
(2) Purity not given, HPLC grade, Mallinckrodt, St. Louis, Missouri, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables: Temperature	**Prepared by:** W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8987	0.1013
288.15	0.8747	0.1253
293.15	0.8615	0.1385
303.15	0.7861	0.2139
308.15	0.7022	0.2978

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[105]X. Wang, C. S. Ponder, and D. J. Kirwan, Cryst. Growth Des. **5**, 85 (2005).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9170	0.08303

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with agitation for 24 h to 72 h in a constant-temperature thermostated water bath. Aliquots of saturated solutions were removed and filtered through a membrane filter of 0.22 μm pore size. Concentrations were determined by spectrophotometric analysis at 304 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Methanol; CH_4O; [67-56-1]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables: T/K = 300.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.377$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.606$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8831	0.1169
288.15	0.8540	0.1460
293.15	0.8347	0.1653
303.15	0.7592	0.2408
308.15	0.6675	0.3325

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) 99.5%, Kemetyl AB, Sweden, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8578	0.1422

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9161	0.08392

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) Absolute, Aaper Alcohol and Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9167	0.0833

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) 99.6%, Arcus AB, Oslo, Norway, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
285.05	0.8768	0.1232
288.65	0.8555	0.1445
293.33	0.8331	0.1669
298.47	0.8021	0.1979
303.39	0.7681	0.2319
307.87	0.7302	0.2698
312.93	0.6842	0.3158
317.95	0.6343	0.3657

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system.
Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[91]U. Domańska, A. Pobudkowska, A. Pelczarska, and P. Gierycz, J. Phys. Chem. B **113**, 8941 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
297.7	0.8207	0.1793
301.2	0.8046	0.1954
305.2	0.7864	0.2136
308.2	0.7587	0.2413
311.1	0.7306	0.2694
314.2	0.7016	0.2984
318.2	0.6636	0.3364
321.6	0.6239	0.3761
324.7	0.5959	0.4041
327.9	0.5432	0.4568
330.3	0.5077	0.4923

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath and an analytical balance.
Solubility was measured using a dynamic synthetic method. Known amounts of solute and solvent were placed in Pyrex glass containers and allowed to equilibrate in a thermostated water bath. The temperature of the bath was slowly increased and the temperature at which the last crystal disappeared was recorded as the solid-liquid equilibrium temperature.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich Chemical Company, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, USA, stored over freshly activated molecular sieves before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[107]J. Manrique and F. Martínez, Braz. Latin Am. Acta Farm. Bonaerense **26**, 344 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.7955	0.2045
298.15	0.7590	0.2410
303.15	0.7160	0.2840
308.15	0.6602	0.3398
313.15	0.6329	0.3671

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a constant-temperature water bath at 313.15 K for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.8881
290.65	0.9466
293.15	1.0219
295.65	1.0953
298.15	1.1327

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.10 μm membrane filter, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) 200 Proof, Pharmaco Products, Brookfield, Connecticut, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[108]A. Jouyban, S. Soltanpour, and W. E. Acree, Jr., J. Chem. Eng. Data **55**, 5252 (2010). [109]S. Soltanpour and A. Jouyban, Chem. Pharm. Bull. **58**, 219 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.2882$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Iran, no purification details were provided.
(2) 99.5%, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.4% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5]	[106]R. M. Watkinson, C. Herkenne, R. H. Guy, J. Hadgraft, G. Oliveira, and M. E. Lane, Skin Pharmacol. Physiol. **22**, 15 (2009).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.424$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, magnetic stirrer, centrifuge, high-performance liquid chromatograph, and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed containers and allowed to equilibrate with continuous stirring in a constant-temperature water bath for 48 h. The sample was then centrifuged for 15 min, and an aliquot of the clear supernatant was removed and diluted. The concentration of the dissolved solute was determined either by high-performance liquid chromatographic or spectrophotometric analysis. The reported value represents the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Wyeth Consumer Health Care, United Kingdom, no purification details were provided in the paper.
(2) Purity not given, Reagent grade, VWR, United Kingdom, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.858	0.142

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Aldrich Chemical Company, Taufkirchen, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8583	0.1417

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
284.17	0.8721	0.1279
288.63	0.8478	0.1522
293.35	0.8226	0.1774
298.25	0.7888	0.2112
303.41	0.7516	0.2484
307.89	0.7113	0.2887
313.01	0.6614	0.3386
318.27	0.6008	0.3992

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system.
Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.7009
290.65	0.7786
293.15	0.8372
295.65	0.8742
298.15	0.9322

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.10 μm membrane filter, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) Purity not given, HPLC grade, Mallinckrodt, St. Louis, Missouri, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.028$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.099$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8717	0.1283
288.15	0.8390	0.1610
293.15	0.8122	0.1878
303.15	0.7258	0.2742
308.15	0.6903	0.3097

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.8099
290.65	0.8630
293.15	0.8764
295.65	0.9445
298.15	1.0062

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.10 μm membrane filter, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) Purity not given, HPLC grade, Mallinckrodt, St. Louis, Missouri, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.7666	0.2334

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
282.97	0.8727	0.1273
288.07	0.8472	0.1528
293.43	0.8124	0.1876
298.21	0.7781	0.2219
303.57	0.7355	0.2645
307.57	0.6949	0.3051
312.75	0.6495	0.3505
318.17	0.5949	0.4051

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.838	0.162

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.97	0.8606	0.1394
288.25	0.8438	0.1562
293.77	0.8088	0.1912
298.73	0.7749	0.2251
303.43	0.7348	0.2652
308.67	0.6886	0.3114
313.47	0.6393	0.3607
318.23	0.5845	0.4155

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
(2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.365$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
(2) 2-Butanol; $C_4H_{10}O$; [78-92-2]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.7960	0.2040

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
(2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.7989	0.2011

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
282.89	0.8925	0.1075
288.09	0.8657	0.1343
293.07	0.8340	0.1660
298.07	0.7978	0.2022
303.23	0.7590	0.2410
308.17	0.7082	0.2918
313.55	0.6517	0.3483
317.85	0.5973	0.4027

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.297$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, ACS grade, Sintorgan, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7864	0.2136

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8167	0.1833

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.852	0.148

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Taufkirchen, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8664	0.1336
288.05	0.8421	0.1579
293.37	0.8098	0.1902
298.03	0.7781	0.2219
303.13	0.7364	0.2636
307.91	0.6897	0.3103
312.57	0.6422	0.3578
318.15	0.5783	0.4217

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system.
Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 3-Methyl-1-butanol; $C_5H_{12}O$; [123-51-3]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.57	0.8794	0.1206
288.61	0.8520	0.1480
293.71	0.8179	0.1821
297.95	0.7887	0.2113
303.13	0.7473	0.2527
308.17	0.7010	0.2990
313.31	0.6475	0.3525
318.83	0.5831	0.4169

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.779	0.221

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Taufkirchen, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.774	0.226

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7798	0.2202

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[102]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, APPS Pharm. Sci. **6**, 3/1 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.802	0.198

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8007	0.1993

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.059
298.2	0.091
310.2	0.122

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]

Original Measurements:
[91]U. Domańska, A. Pobudkowska, A. Pelczarska, and P. Gierycz, J. Phys. Chem. B **113**, 8941 (2009).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
296.7	0.7938	0.2062
303.2	0.7491	0.2509
307.8	0.7103	0.2897
311.1	0.6687	0.3313
315.9	0.6359	0.3641
320.0	0.5915	0.4085
323.7	0.5532	0.4468
326.3	0.5095	0.4905
329.1	0.4675	0.5325
332.4	0.4125	0.5875
334.4	0.3776	0.6224
336.9	0.3251	0.6749
338.7	0.2825	0.7175

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath and an analytical balance.
Solubility was measured using a dynamic synthetic method. Known amounts of solute and solvent were placed in Pyrex glass containers and allowed to equilibrate in a thermostated water bath. The temperature of the bath was slowly increased and the temperature at which the last crystal disappeared was recorded as the solid-liquid equilibrium temperature.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich Chemical Company, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, USA, stored over freshly activated molecular sieves before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error, estimated by compiler).

Components:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]

Original Measurements:
[94]L. C. Garzón and F. Martínez, J. Solution Chem. **33**, 1379 (2004).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298.15	0.6570	0.3430
303.15	0.5576	0.4424
308.15	0.4490	0.5510
313.15	0.2985	0.7015

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker, constant-temperature water bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered glass flask and stirred in a mechanical shaker for 1 h. The flasks were then transferred to a constant-temperature bath where the solution equilibrated for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analysis. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the molar solubilities given in mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, UPS, Mallinckrodt, USA, no purification details were given in the paper.
(2) Purity not given, Extra pure grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error).

Components:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]

Original Measurements:
[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).

Variables:
T/K = 300.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.054$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[103]D. M. Stovall, C. Givens, S. Keown, K. R. Hoover, E. Rodriguez, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **43**, 261 (2005).
(2) 1-Decanol; $C_{10}H_{22}O$; [112-30-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.7834	0.2166

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 264 nm.

Source and Purity of Chemicals:
(1) 98+%, Sigma-Aldrich, St. Louis, Missouri, USA, was dried for several hours at 333 K before use. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, Alfa Aesar, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
(2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9810	0.01904

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
(2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1858$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, ACS grade, Sintorgan, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.9036$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, ACS grade, Sintorgan, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9141	0.08589

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[110]S. Soltanpour and A. Jouyban, J. Mol. Liq. **155**, 80 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.9376$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Daana Pharmaceutical Company, Iran, no purification details were provided.
(2) Purity not given, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.4% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[111]Y. J. Manrique, D. P. Pacheco, and F. Martínez, J. Solution Chem. **37**, 165 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9253	0.0747
298.15	0.9015	0.0985
303.15	0.8590	0.1410
308.15	0.8120	0.1880
313.15	0.7830	0.2170

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate at 313.15 K in a constant-temperature water bath for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The temperature of the water bath was then reduced by 5 K, and the samples re-equilibrated at 308.15 K for an additional two days to allow precipitation of the excess drug. The amount of dissolved drug at the lower temperature was determined by spectroscopic analysis as described above. The procedure was repeated until 293.15 K was reached. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, USP, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.1324
290.65	0.1585
293.15	0.1729
295.65	0.1966
298.15	0.2252

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through Whatman #1 filter paper, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) Purity not given, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[112]P. V. Chuahan, H. K. Patel, B. A. Patel, K. N. Patel, and P. A. Patel, Int. J. Pharm. Res. Scholars **1**, 268 (2012).
Variables:	**Prepared by:**
T/K = Not given, assumed to be ambient room temperature by compiler	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.282$ mol dm^{-3}. Note: The compiler believes that 24 h is not sufficient time for saturation to be reached.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were provided in the paper. Excess solute and solvent were stirred, sonicated for a half hour and then allowed to equilibrate for 24 h. An aliquot of the solution was removed, filtered, and diluted with methanol for spectrophotometric analysis at 222 nm.

Source and Purity of Chemicals:
(1) Purity not given, ACS Chemicals, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: Insufficient information given to estimate.
c_1: Insufficient information to estimate.

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9972	0.00276

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[112]P. V. Chuahan, H. K. Patel, B. A. Patel, K. N. Patel, and P. A. Patel, Int. J. Pharm. Res. Scholars **1**, 268 (2012).
Variables:	**Prepared by:**
T/K = Not given, assumed to be ambient room temperature by compiler	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.408$ mol dm^{-3}. Note: The compiler believes that 24 h is not sufficient time for saturation to be reached.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were provided in the paper. Excess solute and solvent were stirred, sonicated for a half hour and then allowed to equilibrate for 24 h. An aliquot of the solution was removed, filtered, and diluted with methanol for spectrophotometric analysis at 222 nm.

Source and Purity of Chemicals:
(1) Purity not given, ACS Chemicals, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: Insufficient information given to estimate.
c_1: Insufficient information to estimate.

13.8. Ibuprofen solubility data in ketones

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanone; C_3H_6O; [67-64-1]	[101]D. M. Aragón, J. E. Rosas, and F. Martínez, Braz. J. Pharm. Sci. **46**, 227 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.7667	0.2333
298.15	0.7311	0.2689
303.15	0.6879	0.3121
308.15	0.6480	0.3520
313.15	0.6068	0.3932

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanone; C_3H_6O; [67-64-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.6492	0.3508

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanone; C_3H_6O; [67-64-1]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8580	0.1420
288.15	0.8326	0.1674
293.15	0.8008	0.1992
303.15	0.7236	0.2764
308.15	0.6790	0.3210

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanone; C_3H_6O; [67-64-1]	[97]S. Wang, Z. Song, J. Wang, Y. Dong, and M. Wu, J. Chem. Eng. Data **55**, 5283 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.57	0.8563	0.1437
288.49	0.8316	0,1684
293.37	0.8004	0.1996
297.87	0.7670	0.2330
303.07	0.7268	0.2732
308.07	0.6886	0.3114
312.65	0.6484	0.3516
317.99	0.5949	0.4051

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) 99.4%, JiangXi GuoXing Fine Chemical Industry, Co., Ltd., recrystallized twice from ethanol before use.
(2) 99.7+%, Analytical Reagent grade, Beijing Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanone; C_3H_6O; [67-64-1]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.965$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) 4-Methyl-2-pentanone; $C_6H_{12}O$; [108-10-1]	[96]S. Gracin and A. C. Rasmuson, J. Chem. Eng. Data **47**, 1379 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.15	0.8672	0.1328
288.15	0.8405	0.1595
293.15	0.8085	0.1915
303.15	0.7295	0.2705
308.15	0.6836	0.3164

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute. The solubility was reported in the paper as the grams of solute that dissolved per kilogram of solvent. Mole fraction solubility calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, magnetic stirrer, and vacuum drying oven.
Solubility was determined by the gravimetric method. Excess solute and solvent were placed in Erlenmeyer flasks and allowed to equilibrate for 72 h in a thermostatic water bath sitting on a multiple position magnetic stirrer. The solutions were stirred during the equilibration period. The stirring was then stopped for 4 h to allow the suspended solid to settle to the bottom of the flask. A sample of the clear saturated solution was transferred with a heated syringe into a previously weighed sample vial. The vial containing the saturated solution was then weighed, and the solvent was allowed to evaporate in a vacuum oven at 293 K for approximately one week until a constant weight was obtained. The solubility was calculated from the mass of the solid residue and mass of the saturated solution analyzed.

Source and Purity of Chemicals:
(1) 99.4%, AstraZeneca AB, no purification details were given in the paper.
(2) Purity not given, Pro Analyse grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Acetophenone; C_8H_8O; [98-86-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9969	0.00309

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

13.9. Ibuprofen solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8863	0.1137

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7901	0.2099

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Formamide; CH_3NO; [75-12-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9986	0.00143

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8723	0.1277

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Laboratories UPSA, Agen, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.466$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) *N*-Methyl-2-pyrrolidone; C_5H_9NO; [872-50-4]	[113]S. Soltanpour and A. Jouyban, J. Solution Chem. **40**, 2032 (2011).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 5.5121$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Iran, no purification details were provided.
(2) Purity not given, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.1% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	2.383
290.65	2.433
293.15	2.646
295.65	2.711
298.15	3.161

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through Whatman #1 filter paper, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) Purity not given, Acros Organics, New Jersey, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.799$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, was used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, was used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanenitrile; C_2H_3N; [75-05-8]	[95]M. A. Filippa and E. I. Gasull, Fluid Phase Equilib. **354**, 185 (2013).
Variables:	**Prepared by:**
T/K = 300.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.061$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
An UV/visible spectrophotometer.
Very few experimental details were given in the paper. Excess solute and solvent were placed in closed containers and allowed to equilibrate with continuous agitation at constant temperature for 48 h. Aliquots of saturated solutions were removed and diluted quantitatively for spectroscopic analysis at 220 nm.

Source and Purity of Chemicals:
(1) 99%, Sigma-Aldrich Chemical Company, used as received.
(2) Purity not given, Spectroscopic grade, from either Merck Chemical Company or Sigma-Aldrich Chemical Company, used as received.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) (9Z)-Octadecenoic acid (Oleic acid); $C_{18}H_{34}O_2$; [112-80-1]	[114]M. A. Roni and R. Jalil, Dhaka Univ. J. Pharm. Sci. **10**, 65 (2011).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be 311.4 g dm^{-3}, which corresponds to a molar solubility of $c_1 = 1.510$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, centrifuge, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers, shaken in a vortex mixer for 15 min, and allowed to equilibrate at room temperature for 24 h. The sample was then centrifuged for 5 min at 3000 rpm to separate the clear saturated solution from the undissolved solid. The supernatant was filtered through Whatman 102 filter paper and diluted with methanol for spectrophotometric analysis at 222 nm. The reported values represent the average of two experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Xamim Company, China, no purification details were provided in the paper.
(2) Purity not given, Merck Chemical Company, Germany, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 200 (PEG 200)	[108]A. Jouyban, S. Soltanpour, and W. E. Acree, Jr., J. Chem. Eng. Data **55**, 5252 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.9467$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Iran, no purification details were provided in the paper.
(2) 99.5%, Merck Chemical Company, Germany, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.4% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 200 (PEG 200)	[104]I. Khalifeh, Ph.D. dissertation, Purdue University, 2000.
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
288.15	0.1969
290.65	0.2096
293.15	0.2215
295.65	0.2422
298.15	0.2585

[a]s_1: solubility of the solute expressed as grams of dissolved solute per gram. The author did not specify whether it was per gram of solvent or per gram of solution, but it is probably per gram of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, high-precision thermometer, and an UV/visible spectrophotometer.
Excess solute and solvent were allowed to equilibrate with stirring in a constant-temperature water bath for 24 h. An aliquot of the saturated solution was removed, filtered through Whatman #1 filter paper, and then diluted for spectrophotometric analysis at 264 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmacia Upjohn, Kalamazoo, Michigan, USA, was used as received.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±2.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 300 (PEG 300)	[105]X. Wang, C. S. Ponder, and D. J. Kirwan, Cryst. Growth Des. **5**, 85 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7310	0.2690

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]solubility reported in the paper as 253 g of dissolved solute per kilogram of solvent. Mole fraction calculated by compiler assuming a molar mass of 300 g mol^{-1} for PEG 300.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with agitation for 24 h to 72 h in a constant-temperature thermostated water bath. Aliquots of saturated solutions were removed and filtered through a membrane filter of 0.22 μm pore size. Concentrations were determined by spectrophotometric analysis at 304 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 400 (PEG 400)	[108]A. Jouyban, S. Soltanpour, and W. E. Acree, Jr., J. Chem. Eng. Data **55**, 5252 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.2055$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Iran, no purification details were provided in the paper.
(2) Purity not given, Daana Pharmaceutical Company, Iran, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.4% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 400 (PEG 400)	[112]P. V. Chuahan, H. K. Patel, B. A. Patel, K. N. Patel, and P. A. Patel, Int. J. Pharm. Res. Scholars **1**, 268 (2012).
Variables:	**Prepared by:**
T/K = Not given, assumed to be ambient room temperature by compiler	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.591$ mol dm^{-3}. Note: The compiler believes that 24 h is not sufficient time for saturation to be reached.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were provided in the paper. Excess solute and solvent were stirred, sonicated for a half hour and then allowed to equilibrate for 24 h. An aliquot of the solution was removed, filtered, and diluted with methanol for spectrophotometric analysis at 222 nm.

Source and Purity of Chemicals:
(1) Purity not given, ACS Chemicals, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given to estimate.
c_1: Insufficient information to estimate.

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.199$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided in the paper.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided in the paper.

Estimated Error:
Temperature: ± 2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 600 (PEG 600)	[110]S. Soltanpour and A. Jouyban, J. Mol. Liq. **155**, 80 (2010). [109]S. Soltanpour and A. Jouyban, Chem. Pharm. Bull. **58**, 219 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.4425$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker, incubator equipped with a constant temperature controlling system and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated using a shaker placed in an incubator equipped with a constant temperature controlling system for at least 98 h. Aliquots of saturated solutions were removed and diluted quantitatively with methanol for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 222 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Daana Pharmaceutical Company, Iran, no purification details were provided in the paper.
(2) Purity not given, Daana Pharmaceutical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3.4% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Polyethylene glycol 600 (PEG 600)	[112]P. V. Chuahan, H. K. Patel, B. A. Patel, K. N. Patel, and P. A. Patel, Int. J. Pharm. Res. Scholars **1**, 268 (2012).
Variables:	**Prepared by:**
T/K = Not given, assumed to be ambient room temperature by compiler	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.566$ mol dm^{-3}. Note: The compiler believes that 24 h is not sufficient time for saturation to be reached.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were provided in the paper. Excess solute and solvent were stirred, sonicated for a half hour and then allowed to equilibrate for 24 h. An aliquot of the solution was removed, filtered, and diluted with methanol for spectrophotometric analysis at 222 nm.

Source and Purity of Chemicals:
(1) Purity not given, ACS Chemicals, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given to estimate.
c_1: Insufficient information to estimate.

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.122$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sankyo, Pfaffenhofen, Germany, no purification details were provided in the paper.
(2) Purity not given, Parafluid Mineralolgesellschaft, Hamburg, Germany, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Mineral oil	[115]R. M. Watkinson, R. H. Guy, G. Oliveira, J. Hadgraft, and M. E. Lane, Skin Pharmacol. Physiol. **24**, 22 (2011).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.155$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, high-performance liquid chromatograph, and anUV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with stirring in a constant-temperature bath for 48 h. Aliquots of saturated solutions were removed and centrifuged. Concentrations of the dissolved solute were determined by either spectroscopic or high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wyeth Consumer Health Care, Havant, United Kingdom, no purification details were provided in the paper.
(2) Purity not given, Sigma-Aldrich, United Kingdom, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Arachis oil	[114]M. A. Roni and R. Jalil, Dhaka Univ. J. Pharm. Sci. **10**, 65 (2011).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be 113.4 g dm^{-3}, which corresponds to a molar solubility of $c_1 = 0.550$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, centrifuge, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers, shaken in a vortex mixer for 15 min, and allowed to equilibrate at room temperature for 24 h. The sample was then centrifuged for 5 min at 3000 rpm to separate the clear saturated solution from the undissolved solid. The supernatant was filtered through Whatman 102 filter paper and diluted with methanol for spectrophotometric analysis at 222 nm. The reported values represent the average of two experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Xamim Company, China, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Castor oil	[92]D. B. Larsen, H. Parshad, K. Fredholt, and C. Larsen, Int. J. Pharm. **232**, 107 (2002).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.911$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped test tube and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, centrifuged at 15 000 rpm for 10 min, and diluted quantitatively with ethanol for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided in the paper.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Castor oil	[114]M. A. Roni and R. Jalil, Dhaka Univ. J. Pharm. Sci. **10**, 65 (2011).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be 223.7 g dm^{-3}, which corresponds to a molar solubility of $c_1 = 1.084$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, centrifuge, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers, shaken in a vortex mixer for 15 min, and allowed to equilibrate at room temperature for 24 h. The sample was then centrifuged for 5 min at 3000 rpm to separate the clear saturated solution from the undissolved solid. The supernatant was filtered through Whatman 102 filter paper and diluted with methanol for spectrophotometric analysis at 222 nm. The reported values represent the average of two experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Xamim Company, China, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±2% (relative error).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Corn oil	[116]A. Zaghloul, A. Nada, and I. Khattab, Int. J. Pharm. Technol. **3**, 1674 (2011).
Variables:	**Prepared by:**
T/K = 293.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 5.281$ (% mass/volume).

Auxiliary Information

Method/Apparatus/Procedure:
Platform shaker and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were placed a sealed container that was put on a platform shaker and allowed to equilibrate at constant temperature for 24 h. Aliquots of saturated solutions were removed and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, New Jersey, USA, no purification details were provided in the paper.
(2) Purity not given, Sigma Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
s_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Peanut oil	[116]A. Zaghloul, A. Nada, and I. Khattab, Int. J. Pharm. Technol. **3**, 1674 (2011).
Variables:	**Prepared by:**
T/K = 293.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 4.980$ (% mass/volume).

Auxiliary Information

Method/Apparatus/Procedure:
Platform shaker and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were placed in a sealed container that was put on a platform shaker and allowed to equilibrate at constant temperature for 24 h. Aliquots of saturated solutions were removed and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, New Jersey, USA, no purification details were provided in the paper.
(2) Purity not given, Sigma Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
s_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Soybean oil	[116]A. Zaghloul, A. Nada, and I. Khattab, Int. J. Pharm. Technol. **3**, 1674 (2011).
Variables:	**Prepared by:**
T/K = 293.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 8.799$ (% mass/volume).

Auxiliary Information

Method/Apparatus/Procedure:
Platform shaker and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were placed in a sealed container that was put on a platform shaker and allowed to equilibrate at constant temperature for 24 h. Aliquots of saturated solutions were removed and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, New Jersey, USA, no purification details were provided in the paper.
(2) Purity not given, Sigma Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
s_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Soybean oil	[114]M. A. Roni and R. Jalil, Dhaka Univ. J. Pharm. Sci. **10**, 65 (2011).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be 96.3 g dm^{-3}, which corresponds to a molar solubility of $c_1 = 0.467$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, centrifuge, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers, shaken in a vortex mixer for 15 min, and allowed to equilibrate at room temperature for 24 h. The sample was then centrifuged for 5 min at 3000 rpm to separate the clear saturated solution from the undissolved solid. The supernatant was filtered through Whatman 102 filter paper and diluted with methanol for spectrophotometric analysis at 222 nm. The reported values represent the average of two experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Xamim Company, China, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Olive oil	[116]A. Zaghloul, A. Nada, and I. Khattab, Int. J. Pharm. Technol. **3**, 1674 (2011).
Variables:	**Prepared by:**
T/K = 293.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be s_1 = 3.689 (% mass/volume).

Auxiliary Information

Method/Apparatus/Procedure:
Platform shaker and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were placed in a sealed container that was put on a platform shaker and allowed to equilibrate at constant temperature for 24 h. Aliquots of saturated solutions were removed and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis at 252 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, New Jersey, USA, no purification details were provided in the paper.
(2) Purity not given, Sigma Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
s_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Olive oil	[114]M. A. Roni and R. Jalil, Dhaka Univ. J. Pharm. Sci. **10**, 65 (2011).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be 153.3 g dm^{-3}, which corresponds to a molar solubility of $c_1 = 0.743$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, centrifuge, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers, shaken in a vortex mixer for 15 min, and allowed to equilibrate at room temperature for 24 h. The sample was then centrifuged for 5 min at 3000 rpm to separate the clear saturated solution from the undissolved solid. The supernatant was filtered through Whatman 102 filter paper and diluted with methanol for spectrophotometric analysis at 222 nm. The reported values represent the average of two experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Xamim Company, China, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±2% (relative error).

13.10. Ibuprofen solubility data in binary organic solvent mixtures

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid (Ibuprofen); $C_{13}H_{18}O_2$; [15687-27-1] (2) Ethanol; C_2H_6O; [64-17-5] (3) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[117]D. P. Pacheco, Y. J. Manrique, and F. Martinez, Fluid Phase Equilib. **262**, 23 (2007).
Variables:	**Prepared by:**
Temperature; Solvent composition	W. E. Acree, Jr.

Experimental Values

T/K	$w_2^{(s)}$ [a]	x_1 [b]
293.15	0.00	0.0747
293.15	0.20	0.117
293.15	0.40	0.160
293.15	0.60	0.184
293.15	0.80	0.202
293.15	1.00	0.205
298.15	0.00	0.0985
298.15	0.20	0.147
298.15	0.40	0.192
298.15	0.60	0.209
298.15	0.80	0.233
298.15	1.00	0.241
303.15	0.00	0.141
303.15	0.20	0.183
303.15	0.40	0.231
303.15	0.60	0.250
303.15	0.80	0.268
303.15	1.00	0.284

T/K	$w_2^{(s)}$ [a]	x_1 [b]
308.15	0.00	0.188
308.15	0.20	0.230
308.15	0.40	0.276
308.15	0.60	0.290
308.15	0.80	0.316
308.15	1.00	0.340
313.15	0.00	0.217
313.15	0.20	0.260
313.15	0.40	0.310
313.15	0.60	0.337
313.15	0.80	0.363
313.15	1.00	0.367

[a]$w_2^{(s)}$: initial mass fraction of component 2 in the binary solvent mixture.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate at 313.15 K in a constant-temperature water bath for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The temperature of the water bath was then reduced by 5 K, and the samples re-equilibrated at 308.15 K for an additional two days to allow precipitation of the excess drug. The amount of dissolved drug at the lower temperature was determined by spectroscopic analysis as described above. The procedure was repeated until 293.15 K was reached. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were given in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.
(3) Purity not given, USP, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
$w_2^{(s)}$: ±0.01.
x_1: ±3% (relative error).

14. Solubility of Indomethacin in Organic Solvents

14.1. Critical evaluation of experimental solubility data

Indomethacin (more formally named 1-(4-chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid) is a NSAID commonly prescribed by physicians to treat pain and inflammation in individuals suffering from gout, osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, bursitis or tendinitis. There have been several published studies[100,126–130] involving the solubility of indomethacin in organic solvents. Alhalaweh *et al.*[126] determined the solubility of indomethacin in ethyl ethanoate, methanol, and ethanol as part of a much larger study that examined the solubility behavior and solution chemistry of indomethacin-saccharin cocrystals in organic media. Phase solubility diagrams of the cocrystals in various solvents were recorded and the transition concentration (at which the drug and cocrystals are in equilibrium with the solvents) were calculated from the measured solubility data. Takahashi *et al.*[100] measured the solubility of indomethacin in diethyl butanedioate, diethyl hexanedioate, diisopropyl hexanedioate, and diethyl decanedioate at 305 K in their study concerning the use of fatty diesters as a means to enhance NSAID permeation through skin. Hellstén *et al.*[127] measured the solubility of indomethacin in ethyl ethanoate, dichloromethane, methanol, ethanol, and propanone at 298 K, as well as in binary methanol + dichloromethane, ethanol + dichloromethane, methanol + propanone, ethanol + propanone, methanol + ethyl ethanoate, and ethanol + ethyl ethanoate solvent mixtures. The equilibrium solid phase was analyzed using a confocal Raman microscope equipped with a laser. In several of the solvents and mixtures, the authors found evidence of a solid solvate.

Delgado and co-workers[128–130] measured the solubility of indomethacin in ethanol and 1,2-propanediol as a function of temperature using spectroscopic and gravimetric methods of analyses. The internal consistency of the dataset was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). Each of the four data sets is considered internally consistent as evidenced by the small MARD values. The values of the equation coefficients (A, B, and C) are given in Table 8, along with the mean absolute relative deviation.

TABLE 8. Parameters of the Modified Apelblat equation for describing the solubility of indomethacin in ethanol and 1,2-propanediol

Solvent	T/K	A	B	C	MARD (%)
Ethanol[a]	293–313	−74.152	−18.471	12.060	1.2
Ethanol[b]	293–313	−100.928	−19.070	16.727	0.7
1,2-Propanediol[b]	293–313	−107.913	−19.216	17.823	2.7
1,2-Propanediol[c]	293–313	−93.379	−18.870	15.286	1.6

[a]Data set from Ruidiaz *et al.*[129]
[b]Data set from Cantillo *et al.*[128]
[c]Data set from Holguín *et al.*[130]

The experimental solubility data for indomethacin in organic solvents are given in Secs. 14.2–14.6.

14.2. Indomethacin solubility data in esters

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[126]A. Alhalaweh, A. Sokolowski, N. R. Hornedo, and S. P. Velaga, Cryst. Growth Des. **11**, 3923 (2011).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.102$ mol dm^{-3}. The equilibrium solid phase was the γ-form of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer, constant-temperature bath, x-ray powder diffractometer, and a high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate at a constant temperature with stirring for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.2 μm cellulose acetate membrane filter or 0.45 μm polypropylene membrane filter, and diluted quantitatively for high-performance liquid chromatographic analyses. Solubility measurements were repeated after an additional 72 h to ensure that equilibrium had been obtained. Samples of the equilibrated solid phase were removed, filtered, dried, and analyzed by powder x-ray diffraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, Stockholm, Sweden, used as received.
(2) Purity not given, Sigma-Aldrich Chemical Company, used as received.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
Variables:	**Prepared by:**
T/K = 298.2	W. E. Acree, Jr.

Experimental Values

The measured molal solubility was reported to be $m_1 = 0.127$ mol/kg of solvent. The equilibrated solid phase was the α-form and γ-form of indomethacin plus a solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) 99.5%, Merck Chemical Company, Germany, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
m_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Diethyl butanedioate; $C_8H_{14}O_4$; [123-25-1]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0874$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Diethyl hexanedioate; $C_{10}H_{18}O_4$; [141-28-6]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1068$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Diisopropyl hexanedioate; $C_{12}H_{22}O_4$; [6938-94-9]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0578$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Diethyl decanedioate; $C_{14}H_{26}O_4$; [110-40-7]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0582$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

14.3. Indomethacin solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Dichloromethane; CH_2Cl_2; [75-09-2]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
Variables:	**Prepared by:**
T/K = 298.2	W. E. Acree, Jr.

Experimental Values

The measured molal solubility was reported to be $m_1 = 0.135$ mol/kg of solvent. The equilibrated solid phase was the α-form of indomethacin plus a solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, stabilized with 0.5% of methanol, Orion, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
m_1: ±3% (relative error, estimated by compiler).

14.4. Indomethacin solubility data in alcohols

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[126]A. Alhalaweh, A. Sokolowski, N. R. Hornedo, and S. P. Velaga, Cryst. Growth Des. **11**, 3923 (2011).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.047$ mol dm^{-3}. The equilibrium solid phase was a methanol solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer, constant-temperature bath, x-ray powder diffractometer, and a high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate at a constant temperature with stirring for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.2 μm cellulose acetate membrane filter or 0.45 μm polypropylene membrane filter, and diluted quantitatively for high-performance liquid chromatographic analyses. Solubility measurements were repeated after an additional 72 h to ensure that equilibrium had been obtained. Samples of the equilibrated solid phase were removed, filtered, dried, and analyzed by powder x-ray diffraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, Stockholm, Sweden, used as received.
(2) Purity not given, Analytical Reagent grade, Sigma-Aldrich Chemical Company, used as received.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.2	W. E. Acree, Jr.

Experimental Values

The measured molal solubility was reported to be $m_1 = 0.0712$ mol/kg of solvent. The equilibrated solid phase was the α-form of indomethacin plus a solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, LiChrosolv grade, Merck Chemical Company, Germany, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
m_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.2	W. E. Acree, Jr.

Experimental Values

The measured molal solubility was reported to be $m_1 = 0.0781$ mol/kg of solvent. The equilibrated solid phase was the α-form and γ-form of indomethacin.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) 99.5%, Altia Chemical Company, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
m_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[128]E. A. Cantillo, D. R. Delgado, and F. Martinez, J. Mol. Liq. **181**, 62 (2013).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9975	0.002530
298.15	0.9966	0.003423
303.15	0.9955	0.004528
308.15	0.9941	0.005877
313.15	0.9923	0.007711

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker bath, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with stirring in a thermostatic mechanical shaker bath (for measurements at 303.15, 308.15, and 313.15 K), or in a recirculating thermostatic bath (for measurements at 293.15 and 298.15 K) for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively with an aqueous 0.10 molar sodium hydroxide solution. The molar solubility of the drug was determined by spectrophotometric analysis at 281 nm. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, USA, no purification details were given in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3% (relative error).

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[129]M. A. Ruidiaz, D. R. Delgado, and F. Martinez, Rev. Acad. Colomb. Cienc. **35**, 329 (2011).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9967	0.003318
298.15	0.9958	0.004169
303.15	0.9951	0.004887
308.15	0.9938	0.006166
313.15	0.9926	0.007413

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with sporadic stirring in a constant-temperature bath for at least three days. An aliquot of the saturated solution was removed and isothermally filtered to remove insoluble particles. The solubility of the drug was determined by mass balance weighing of a specified quantity of the saturated solution and then allowing the solvent to evaporate until a constant residue mass is obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. The reported value represents the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, meet British Pharmacopoeia quality requirements, chemical source not specified, no purification details were provided in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, dried over molecular sieves before use.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±6% (relative error).

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[126]A. Alhalaweh, A. Sokolowski, N. R. Hornedo, and S. P. Velaga, Cryst. Growth Des. **11**, 3923 (2011).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.054$ mol dm^{-3}. The equilibrium solid phase was the γ-form of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer, constant-temperature bath, x-ray powder diffractometer, and a high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate at a constant temperature with stirring for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.2 μm cellulose acetate membrane filter or 0.45 μm polypropylene membrane filter, and diluted quantitatively for high-performance liquid chromatographic analyses. Solubility measurements were repeated after an additional 72 h to ensure that equilibrium had been obtained. Samples of the equilibrated solid phase were removed, filtered, dried, and analyzed by powder x-ray diffraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, Stockholm, Sweden, used as received.
(2) 99.5%, Kemetyl, Sweden, used as received.

Estimated Error:
Temperature: ± 0.5 K.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[128]E. A. Cantillo, D. R. Delgado, and F. Martinez, J. Mol. Liq. **181**, 62 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9988	0.001186
298.15	0.9984	0.001588
303.15	0.9978	0.002204
308.15	0.9969	0.003082
313.15	0.9963	0.003719

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker bath, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with stirring in a thermostatic mechanical shaker bath (for measurements at 303.15, 308.15, and 313.15 K), or in a recirculating thermostatic bath (for measurements at 293.15 and 298.15 K) for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively with an aqueous 0.10 molar sodium hydroxide solution. The molar solubility of the drug was determined by spectrophotometric analysis at 281 nm. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, USA, no purification details were given in the paper.
(2) Purity not given, Dow Chemical Company, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[130]A. R. Holguín, G. A. Rodríguez, D. M. Cristancho, D. R. Delgado, and F. Martínez, Fluid Phase. Equil. **314**, 134 (2012).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9986	0.001372
298.15	0.9983	0.001690
303.15	0.9977	0.002267
308.15	0.9970	0.002950
313.15	0.9963	0.003683

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker bath, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with stirring in a thermostatic mechanical shaker bath (for measurements at 303.15, 308.15, and 313.15 K), or in a recirculating thermostatic bath (for measurements at 293.15 and 298.15 K) for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analyses. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities.

Source and Purity of Chemicals:
(1) 99.8%, chemical source not specified, no purification details were given in the paper.
(2) 99.8%, chemical source not specified, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

14.5. Indomethacin solubility data in ketones

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
(2) Propanone; C_3H_6O; [67-64-1]	
Variables:	**Prepared by:**
T/K = 298.2	W. E. Acree, Jr.

Experimental Values

The measured molal solubility was reported to be m_1 = 0.358 mol/kg of solvent. The equilibrated solid phase was the α-form of indomethacin plus solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
m_1: ±3% (relative error, estimated by compiler).

14.6. Indomethacin solubility data in binary organic solvent mixtures

Components:	Original Measurements:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]	[128]E. A. Cantillo, D. R. Delgado, and F. Martinez, J. Mol. Liq. **181**, 62 (2013).
(2) Ethanol; C_2H_6O; [64-17-5]	
(3) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	
Variables:	**Prepared by:**
Temperature; Solvent composition	W. E. Acree, Jr.

Experimental Values

T/K	$w_2^{(s)}$ [a]	x_1 [b]
293.15	0.00	0.001186
293.15	0.10	0.001201
293.15	0.20	0.001246
293.15	0.30	0.001291
293.15	0.40	0.001430
293.15	0.50	0.001509
293.15	0.60	0.001696
293.15	0.70	0.001854
293.15	0.80	0.002109
293.15	0.90	0.002303
293.15	1.00	0.002530
298.15	0.00	0.001588
298.15	0.10	0.001626
298.15	0.20	0.001696
298.15	0.30	0.001820
298.15	0.40	0.001988
298.15	0.50	0.002181
298.15	0.60	0.002403
298.15	0.70	0.002542
298.15	0.80	0.002824
298.15	0.90	0.003258
298.15	1.00	0.003423
303.15	0.00	0.002204
303.15	0.10	0.002250
303.15	0.20	0.002284
303.15	0.30	0.002442
303.15	0.40	0.002675
303.15	0.50	0.002960
303.15	0.60	0.003310
303.15	0.70	0.003569
303.15	0.80	0.003861
303.15	0.90	0.004369
303.15	1.00	0.004528
308.15	0.00	0.003082
308.15	0.10	0.003107
308.15	0.20	0.003148
308.15	0.30	0.003258
308.15	0.40	0.003657
308.15	0.50	0.003980
308.15	0.60	0.004528
308.15	0.70	0.004902
308.15	0.80	0.005406
308.15	0.90	0.005807
308.15	1.00	0.005877
313.15	0.00	0.003719
313.15	0.10	0.003807
313.15	0.20	0.004031
313.15	0.30	0.004309
313.15	0.40	0.004809
313.15	0.50	0.005289
313.15	0.60	0.006103
313.15	0.70	0.006701
313.15	0.80	0.007509
313.15	0.90	0.007650
313.15	1.00	0.007711

[a] $w_2^{(s)}$: initial mass fraction of component 2 in the binary solvent mixture.
[b] x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker bath, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with stirring in a thermostatic mechanical shaker bath (for measurements at 303.15, 308.15, and 313.15 K), or in a recirculating thermostatic bath (for measurements at 293.15 and 298.15 K) for at least three days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively with an aqueous 0.10 molar sodium hydroxide solution. The molar solubility of the drug was determined by spectrophotometric analysis at 281 nm. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, USA, no purification details were given in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.
(3) Purity not given, Dow Chemical Company, USA, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.01 K.
$w_2^{(s)}$: ±0.01.
x_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Methanol; CH_4O; [67-56-1] (3) Dichloromethane; CH_2Cl_2; [75-09-2]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
Variables:	**Prepared by:**
T/K = 298.2; Solvent composition	W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.135	α-form + solvate
0.227	0.783	α-form + solvate
0.397	0.969	α-form + solvate
0.399	0.930	α-form + solvate
0.532	0.885	α-form + solvate
0.534	0.862	Solvate
0.638	0.731	Solvate
0.640	0.696	Solvate
0.799	0.336	Solvate
1.000	0.0712	α-form + solvate

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, LiChrosolv, Merck Chemical Company, used as received.
(3) Purity not given, stabilized with 0.5% of methanol, Orion, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1] (2) Ethanol; C_2H_6O; [64-17-5] (3) Dichloromethane; CH_2Cl_2; [75-09-2]	[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).
Variables:	**Prepared by:**
T/K = 298.2; Solvent composition	W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.135	α-form + solvate
0.170	0.653	Solvate
0.245	0.672	Solvate
0.315	0.710	Solvate
0.316	0.498	Solvate
0.381	0.468	α-form + γ-form
0.442	0.766	Solvate
0.443	0.787	Solvate
0.549	0.610	γ-form + solvate
0.552	0.469	α-form
0.646	0.476	α-form + γ-form
0.729	0.335	γ-form
1.000	0.078	α-form + γ-form

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) 99.5%, Altia Chemical Company, used as received.
(3) Purity not given, stabilized with 0.5% of methanol, Orion, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

Components:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]
(2) Methanol; CH_4O; [67-56-1]
(3) Propanone; C_3H_6O; [67-64-1]

Original Measurements:
[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).

Variables:
T/K = 298.2; Solvent composition

Prepared by:
W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.358	α-form + solvate
0.233	0.339	Solvate
0.234	0.585	Solvate
0.407	0.634	γ-form + solvate
0.408	0.621	α-form
0.477	0.635	γ-form
0.478	0.673	Solvate
0.540	0.612	γ-form
0.541	0.640	γ-form + solvate
0.646	0.579	α-form + solvate
0.647	0.576	α-form + γ-form
0.804	0.385	α-form + γ-form
0.805	0.395	γ-form + solvate
1.000	0.071	α-form + solvate

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, LiChrosolv, Merck Chemical Company, used as received.
(3) Purity not give, Analytical Reagent grade, Merck Chemical Company, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

Components:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]
(2) Ethanol; C_2H_6O; [64-17-5]
(3) Propanone; C_3H_6O; [67-64-1]

Original Measurements:
[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).

Variables:
T/K = 298.2; Solvent composition

Prepared by:
W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.358	α-form + solvate
0.175	0.501	Solvate
0.255	0.558	γ-form + solvate
0.323	0.589	γ-form + solvate
0.324	0.609	α-form + solvate
0.450	0.593	α-form + γ-form + solvate
0.451	0.601	α-form + γ-form
0.560	0.568	α-form + γ-form + solvate
0.562	0.573	α-form + γ-form
0.657	0.505	α-form + γ-form
0.741	0.423	α-form + γ-form
0.741	0.421	α-form
1.000	0.078	α-form + solvate

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) 99.5%, Altia Chemical Company, was used as received.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

Components:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]
(2) Methanol; CH_4O; [67-56-1]
(3) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]

Original Measurements:
[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).

Variables:
T/K = 298.2; Solvent composition

Prepared by:
W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.127	α-form + γ-form + solvate
0.234	0.297	α-form + γ-form
0.407	0.406	α-form + γ-form
0.409	0.393	γ-form
0.437	0.425	α-form
0.478	0.418	α-form
0.539	0.430	α-form
0.541	0.416	α-form + γ-form
0.597	0.418	α-form + γ-form
0.647	0.402	α-form + γ-form
0.650	0.406	γ-form
0.733	0.359	α-form + γ-form + solvate
0.805	0.268	α-form + solvate
1.000	0.071	α-form + solvate

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) Purity not given, LiChrosolv, Merck Chemical Company, used as received.
(3) 99.5%, Merck Chemical Company, Germany, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

Components:
(1) 1-(4-Chlorobenzoyl)-2-methyl-5-methoxyindole-3-acetic acid (Indomethacin); $C_{15}H_{16}ClNO_4$; [53-86-1]
(2) Ethanol; C_2H_6O; [64-17-5]
(3) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]

Original Measurements:
[127]S. Hellstén, H. Qu, and M. Louhi-Kultanen, Chem. Eng. Technol. **34**, 1667 (2011).

Variables:
T/K = 298.2; Solvent composition

Prepared by:
W. E. Acree, Jr.

Experimental Values

$x_2^{(s)}$[a]	m_1[b]	Equilibrated solid phase[c]
0.000	0.127	α-form + γ-form + solvate
0.328	0.349	α-form
0.451	0.377	α-form + γ-form
0.481	0.374	α-form
0.512	0.387	α-form
0.559	0.366	α-form
0.561	0.367	α-form
0.610	0.358	α-form + solvate
0.656	0.329	α-form + γ-form
0.656	0.331	α-form + γ-form
0.700	0.303	α-form + γ-form
0.742	0.275	γ-form
0.816	0.222	γ-form
0.818	0.219	α-form
1.000	0.078	α-form + γ-form

[a]$x_2^{(s)}$: initial mole fraction of component 2 in the binary solvent mixture.
[b]m_1: molal solubility of the solute given as moles of dissolved solute per kilogram of solvent.
[c]Possible phases: α-form of indomethacin, γ-form of indomethacin, and solid solvate.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, confocal Raman microscope equipped with a laser.
Solubility was determined gravimetrically using the shake flask method. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate in a constant-temperature bath with stirring for 24 h. An aliquot of the saturated solution was withdrawn using a syringe equipped with a 0.20 μm pore size cellulose membrane filter. The sample was transferred to a tared container, weighed, and the solvent evaporated at reduced pressure at 309 K until constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the sample analyzed. The equilibrated solid phase was analyzed using a confocal Raman microscope equipped with a laser operating at 785 nm as the excitation source.

Source and Purity of Chemicals:
(1) Purity not given, USP grade, Hawkins, Inc., used as received.
(2) 99.5%, Altia Chemical Company, was used as received.
(3) 99.5%, Merck Chemical Company, Germany, used as received.

Estimated Error:
Temperature: ±0.2 K.
$x_2^{(s)}$: ±0.001.
m_1: ±3% (relative error).

15. Solubility of Ketoprofen in Organic Solvents

15.1. Critical evaluation of experimental solubility data

Ketoprofen (more formally named 3-benzoyl-α-methylbenzeneacetic acid) is a NSAID which is available in both nonprescription and prescription formulations. Nonprescription ketoprofen is used to relieve minor headaches, toothaches, muscle and backaches, and the common cold. Physicians prescribe ketoprofen to individuals suffering with osteoarthritis and rheumatoid arthritis to manage pain and inflammation. There have been several published studies[60,64,65,100,131–143] involving the solubility of ketoprofen in organic solvents at 298 K. Most notably, Perlovich *et al.*[136] determined the mole-fraction solubility of ketoprofen in eight primary alcohols (methanol, ethanol, 1-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, and 1-octanol). Daniels *et al.*[134] later reported the solubility behavior of ketoprofen in ethyl ethanoate, 1,1′-oxybisethane, methanol, ethanol, 1-propanol, 2-propanol, 2-methyl-1-propanol, 1-pentanol, and 1-decanol. Bustamante and Selles,[133] Gantiva and Martínez,[139] Ribeiro *et al.*,[137] and Fini *et al.*[60] also performed ketoprofen solubility measurements at 298 K. Takahashi *et al.*[100] measured the solubility of ketoprofen in diethyl butanedioate, diethyl hexanedioate, diisopropyl hexanedioate, and diethyl decanedioate at 305 K in their study concerning the use of fatty diesters as a means to enhance NSAID permeation through skin. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. Kumprakob *et al.*[141] determined the solubility of ketoprofen in binary water + 1,2-propanediol and water + 1,2,3-propanetriol solvent mixtures at 310 K over the entire solvent composition range. They reported the experimental solubility in 1,2-propanediol as 369.1 mg/ml of saturated solution. Solubility data for the binary mixtures were given only in graphical form as the milligrams of dissolved solute per milliliter of saturated solution versus the initial volume percent composition of the organic cosolvent calculated as if the solute were not present.

Daniels *et al.*[134] used their measured solubility data for ketoprofen in ethyl ethanoate, 1,1′-oxybisethane, and seven alcohol solvents, combined with published solubility and partition coefficient data, to calculate the Abraham solute descriptors of ketoprofen. The authors were able to assemble a total of 19 $\log_{10}(SR \text{ or } P)$ equations for which experimental partition coefficient data, solubility ratios, Abraham Model equation coefficients, and aqueous molar solubility were available. The logarithm of the aqueous molar solubility of ketoprofen is $\log_{10}c_{1,W} = -3.16$.[118,144,145] Other numerical values for the molar solubility of ketoprofen in water are $\log_{10}c_{1,W} = -3.29$,[146] $\log_{10}c_{1,W} = -3.25$,[60] $\log_{10}c_{1,W} = -3.33$,[147] and $\log_{10}c_{1,W} = -3.43$.[148] The McGowan volume of ketoprofen, $V = 1.9779$, was calculated from the number of chemical bonds in the molecule and the individual atomic group volumes, AV_i, given in Sec. 1.3. The excess molar refraction solute descriptor was estimated as $E = 1.650$. This left three solute descriptors (S, A, and B) still to be determined. The 19 equations were then solved using the Microsoft "SOLVER" program to yield numerical values of the remaining solute descriptors, $S = 2.260$, $A = 0.550$, and $B = 0.890$, that best described the $\log_{10}(SR \text{ or } P)$ values. The calculated molecular solute descriptors reproduced the $\log_{10}(SR \text{ or } P)$ values to within an average standard deviation of 0.123 $\log_{10}$ units.

Table 9 compares the experimental $\log_{10}c_1$ values to calculated values based on Eq. (28) of the Abraham model. For comparison purposes, the measured mole-fraction solubilities of ketoprofen, x_1, determined by Daniels *et al.*[134] were converted into molar solubilities by dividing x_1 by the ideal molar volume of the saturated solution (i.e., $c_1^{\text{sat}} = x_1/[x_1V_1 + (1-x_1)V_{\text{solvent}}]$. The molar volume of the hypothetical subcooled liquid ketoprofen is $V_{\text{solute}} = 185.75 \text{ cm}^3 \text{ mol}^{-1}$. Examination of the numerical entries in Table 9 reveals that the Abraham model provides a reasonably accurate mathematical description of the observed solubility data for many of the organic solvents.

There is considerable variation in the independent sets of ketoprofen solubility data for both methanol and ethanol at 298 K. In the case of ethanol, the molar solubility data determined by Daniels *et al.*[134] ($\log_{10}c_1 = -0.040$) is in very good agreement with the value reported by Perlovich *et al.*[136] ($\log_{10}c_1 = -0.069$). Both sets of values differ significantly from the value of $\log_{10}c_1 = 0.0429$ that Ribeiro *et al.*[137] published. For ethanol, there have been five published experimental values for the molar solubility of ketoprofen, and the values differ fairly significantly, ranging from $c_1 = 0.685$ mol dm^{-3} to $c_1 = 2.685$ mol dm^{-3}. Given the large variation in the observed values, it is not possible to list a recommended value. More detailed studies are needed to identify the reason for the large differences in published values. Future studies need to

TABLE 9. Comparison between observed and predicted molar solubilities of ketoprofen based on the Abraham model, Eq. (28)

Solvent	$\log_{10}c_1^{calc}$; Eq. (28)	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$
Methanol	0.120	−0.040[a]	−0.069[b]	0.391[c]	
Ethanol	0.183	0.016[a]	−0.019[b]	−0.164[d]	0.242[c]
		0.429[e]			
1-Propanol	−0.042	0.000[a]	0.000[b]		
2-Propanol	0.002	0.146[a]			
1-Butanol	−0.228	−0.062[b]			
2-Butanol	0.012	0.144[a]			
2-Methyl-1-propanol	−0.162	−0.004[a]			
1-Pentanol	−0.186	−0.169[a]	−0.168[b]		
1-Hexanol	−0.107	−0.203[b]			
1-Heptanol	−0.165	−0.333[b]			
1-Octanol	−0.188	−0.366[b]	−0.349[f]		
1-Decanol	−0.361	−0.362[a]			
1,1′-Oxybisethane	−0.124	−0.010[a]			
Ethyl ethanoate	0.167	0.136[a]			

[a]Experimental value from Daniels *et al.*[134]
[b]Experimental value from Perlovich *et al.*[136]
[c]Experimental value from Ribeiro *et al.*[137]
[d]Experimental value from Gantiva and Martínez.[139]
[e]Experimental value from Gantiva *et al.*[138]
[f]Experimental value from Fini *et al.*[60]

examine the equilibrated solid phase in greater detail to determine if ketoprofen exhibits polymorphism and whether the phase is crystalline. For the other solvents listed in Table 9, there are at most only two independent measurements.

There have been four experimental studies[60,138,139,142] reporting the solubility of ketoprofen as a function of temperature. Fini *et al.*[60] determined the molar solubility of ketoprofen in 1-octanol at only three temperatures from 278 to 310 K. Gantiva *et al.*[138,139] measured the solubility of ketoprofen in cyclohexane, ethanol, and 1,2-propanediol at several temperatures from 293 to 313 K using a spectrophotometric method of analysis. Espitalier *et al.*[142] reported solubility data for ketoprofen in propanone at several temperatures between 283 and 322 K. The authors used an hplc to quantify the concentration of the dissolved solute. The internal consistency of the latter four datasets was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 10, along with the mean absolute relative deviation. Each of the four data sets is considered internally consistent as evidenced by the small MARD values. There were insufficient experimental measurements in the Fini *et al.*[60] dataset to obtain a meaningful regression analysis.

TABLE 10. Parameters of the Modified Apelblat equation for describing the solubility of ketoprofen in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Cyclohexane[a]	293–313	−140.622	113.960	22.896	4.4
Ethanol[b]	293–313	−43.246	116.185	7.271	0.1
1,2-Propanediol[a]	293–313	−44.702	116.160	7.026	0.4
Propanone[c]	283–322	−50.372	116.031	8.463	0.9

[a]Data set of Gantiva and Martínez.[139]
[b]Data set of Gantiva *et al.*[138]
[c]Data set of Espitalier *et al.*[142]

The experimental solubility data for ketoprofen in organic solvents are given in Secs. 15.2–15.9.

15.2. Ketoprofen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[131]N. A. Abd-El Gawad, Bull. Fac. Pharm. Cairo Univ. **35**, 137 (1997).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9989	0.0011

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Oscillating thermostatically controlled water bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped vial, and allowed to equilibrate with shaking for 24 h in a constant-temperature bath. At the end of the shaking period, the sample was allowed to stand unagitated for another hour to allow the undissolved solid to the settle to the bottom of the container. Aliquots of saturated solution were withdrawn and rapidly filtered through a 0.45 μm membrane filter. Concentrations were determined by spectrophotometric measurements at 260 nm.

Source and Purity of Chemicals:
(1) Purity not given, Alexandria Pharmaceutical Company, Egypt, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[132]M. Gantiva and F. Martínez, Fluid Phase Equilib. **293**, 242 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9999	0.0000366
298.15	0.9999	0.0000598
303.15	0.9999	0.0000807
308.15	0.9999	0.0001240
313.15	0.9998	0.0001620

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, which was then diluted for spectrophotometric analysis. The concentration of the dissolved drug was determined from the measured absorbance. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, authors stated that the sample met requirements indicated in the American Pharmacopeia, USP.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3.0% (relative error, estimated by compiler).

15.3. Ketoprofen solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Benzene; C_6H_6; [71-43-2]	[133]P. Bustamante and E. Selles, Ciencia Ind. Farm. **2**, 403 (1983).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured mole fraction solubility was reported to be $x_1 = 0.0334$.

Auxiliary Information

Method/Apparatus/Procedure:
This is a secondary reference. The authors reference the experimental data to a presentation that they made in 1982.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Methylbenzene; C_7H_8; [108-88-3]	[133]P. Bustamante and E. Selles, Ciencia Ind. Farm. **2**, 403 (1983).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured mole fraction solubility was reported to be $x_1 = 0.0207$.

Auxiliary Information

Method/Apparatus/Procedure:
This is a secondary reference. The authors reference the experimental data to a presentation that they made in 1982.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
x_1: ±5% (relative error, estimated by compiler).

15.4. Ketoprofen solubility data in esters

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8470	0.1530

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99.9%, HPLC grade, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be c_1 = 0.05899 mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed and filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±2.7% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Diethyl butanedioate; $C_8H_{14}O_4$; [123-25-1]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be c_1 = 0.7947 mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Diethyl hexanedioate; $C_{10}H_{18}O_4$; [141-28-6]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.7947$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Diisopropyl hexanedioate; $C_{12}H_{22}O_4$; [6938-94-9]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.4619$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Diethyl decanedioate; $C_{14}H_{26}O_4$; [110-40-7]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.4557$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

15.5. Ketoprofen solubility data in ethers

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8888	0.1112

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

15.6. Ketoprofen solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[133]P. Bustamante and E. Selles, Ciencia Ind. Farm. **2**, 403 (1983).
(2) Trichloromethane; $CHCl_3$; [67-66-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured mole fraction solubility was reported to be $x_1 = 0.1419$.

Auxiliary Information

Method/Apparatus/Procedure:
This is a secondary reference. The authors reference the experimental data to a presentation that they made in 1982.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
x_1: ±5% (relative error, estimated by compiler).

15.7. Ketoprofen solubility data in alcohols

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9604	0.0396

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9572	0.0428

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99.8%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[137]A. E. Ribeiro, N. S. Graca, L. S. Pais, and A. E. Rodrigues, Sep. Purif. Technol. **61**, 375 (2008).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8444	0.1556

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Excess solute and solvent were placed in sealed containers and allowed to equilibrate in a constant-temperature bath. After equilibrium was reached, an aliquot of the clear saturated solution was transferred to a previously weighed glass vial. The mass of the vial plus the saturated solution was recorded. The vial was then placed in oven at 303 K for solvent evaporation until a constant mass was obtained. The solubility of the solute was calculated based on the mass of the solid residue and mass of the sample analyzed.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9360	0.0640

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) 99.6%, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9299	0.0701

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) Absolute, Aaper Alcohol and Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Ethanol; C_2H_6O; [64-17-5]	[138]M. Gantiva, A. Yurquina, and F. Martínez, J. Chem. Eng. Data **55**, 113 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.7871	0.2129
298.15	0.7608	0.2392
303.15	0.7318	0.2682
308.15	0.6999	0.3001
313.15	0.6647	0.3353

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, which was then diluted for spectrophotometric analysis. The concentration of the dissolved drug was determined from the measured absorbance. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, authors stated that the sample met requirements indicated in the American Pharmacopeia, USP.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Ethanol; C_2H_6O; [64-17-5]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 1.805$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±6% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Ethanol; C_2H_6O; [64-17-5]	[139]M. Gantiva and F. Martínez, Quim. Nova **33**, 370 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9559	0.0441

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in glass bottles and then saturated in a constant-temperature bath for five days at 313.15 K. The samples were allowed to equilibrate in a constant temperature at 298.15 K for an additional two days to allow the precipitation of the excess dissolved drug. An aliquot of the saturated solution was then removed, filtered, and diluted quantitatively with alcohol for spectroscopic analysis. The reported value represents the average of at least three experimental determinations. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Ethanol; C_2H_6O; [64-17-5]	[137]A. E. Ribeiro, N. S. Graca, L. S. Pais, and A. E. Rodrigues, Sep. Purif. Technol. **61**, 375 (2008).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8683	0.1317

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Excess solute and solvent were placed in sealed containers and allowed to equilibrate in a constant-temperature bath. After equilibrium was reached an aliquot of the clear saturated solution was transferred to a previously weighed glass vial. The mass of the vial plus the saturated solution was recorded. The vial was then placed in oven at 303 K for solvent evaporation until a constant mass was obtained. The solubility of the solute was calculated based on the mass of the solid residue and mass of the sample analyzed.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Propanol; C_3H_8O; [71-23-8]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9155	0.0845

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
(2) 1-Propanol; C_3H_8O; [71-23-8]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9152	0.0848

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
(2) 2-Propanol; C_3H_8O; [67-63-0]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8731	0.1269

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
(2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9132	0.0868

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 2-Butanol; $C_4H_{10}O$; [78-92-2]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8520	0.1480

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8991	0.1009

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9222	0.0778

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9224	0.0776

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9186	0.0814

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9326	0.0674

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[136]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, J. Pharm. Sci. **92**, 2502 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9309	0.0691

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be c_1 = 0.5466 mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.227
298.2	0.448
310.2	0.667

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1-Decanol; $C_{10}H_{22}O$; [112-30-1]	[134]C. R. Daniels, A. K. Charlton, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 305 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9169	0.0831

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 280 nm.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich, St. Louis, Missouri, USA, and 99%, TCI America, Portland, Oregon, USA, was used as received. The purity of the commercial sample was 99.7% as determined by nonaqueous titration with freshly standardized sodium methoxide to the thymol blue endpoint according to the method of [J. S. Fritz and N. M. Lisicki, Anal. Chem. **23**, 589 (1951)], except that methylbenzene was substituted for benzene in the titration solvent.
(2) 99+%, Alfa Aesar, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 0.7826$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±12% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[140]G. V. Vittal, R. Deveswaran, S. Bharath, B. V. Basavaraj, and V. Madhavan, Int. J. Pharm. Invest. **2**, 150 (2012).
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 1000$ mg cm^{-3}. Note: It is not apparent from reading the paper whether the amount dissolved is per cm^3 of saturated solution or per cm^3 of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in volumetric flask and then allowed to equilibrate at ambient room temperature in a water shaker bath for 48 h under continued vibration. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA), and diluted for spectrophotometric analysis at 260 nm. The reported value represents the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Yarrow Chem Products, Mumbai, India, no purification details were provided.
(2) Purity not given, Ranbaxy Fine Chemicals Ltd., New Delhi, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±12% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4]	[141]U. Kumprakob, J. Kawakami, and I. Adachi, Biol. Pharm. Bull. **28**, 1684 (2005).
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 369.1$ mg cm^{-3}, which corresponds to a molar solubility of $c_1 = 1.452$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph equipped with an UV absorbance detector.
Excess solute and solvent were placed in sealed containers and then allowed to equilibrate with stirring in a water bath for 24 h. The sample was then centrifuged and an aliquot of the clear supernatant was removed. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis at 254 nm.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries, Ltd., Japan, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Nacalai Tesque, Inc., Japan, no purification details were provided.

Estimated Error:
Temperature: ±0.2 (estimated by compiler).
s_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[132]M. Gantiva and F. Martínez, Fluid Phase Equilib. **293**, 242 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9876	0.01236
298.15	0.9862	0.01383
303.15	0.9845	0.01550
308.15	0.9826	0.01740
313.15	0.9809	0.01905

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, which was then diluted for spectrophotometric analysis. The concentration of the dissolved drug was determined from the measured absorbance. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, authors stated that the sample met requirements indicated in the American Pharmacopeia, USP.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) (*Z*)-Octadec-9-en-1-ol (Oleyl alcohol); $C_{18}H_{36}O$; [143-28-2]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be c_1 = 0.1888 mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±13% (relative error, estimated by compiler).

15.8. Ketoprofen solubility data in ketones

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Propanone; C_3H_6O; [67-64-1]	[142]P. Espitalier, B. Biscans, and C. Laguérie, J. Chem. Eng. Data **40**, 1222 (1995).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b,c]
283.0	0.8861	0.1139
293.0	0.8525	0.1475
303.1	0.8061	0.1939
314.3	0.7343	0.2657
322.5	0.6763	0.3237

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]solubility data reported in the paper as mass fractions. The tabulated mole fraction solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and high-performance liquid chromatographic analysis with UV detection.
Experimental method consisted of periodically dissolving small quantities of solid solute in a stirred solution of solvent maintained at constant temperature. When the solid did not appear to dissolve any more, the suspension was stirred for a few additional days to ensure saturation. During this time the solution was withdrawn by syringe, filtered at ambient room temperature through a 0.45 μm porosity membrane filter, and analyzed by high-performance liquid chromatography at 280 nm.

Source and Purity of Chemicals:
(1) 99.9%, Rhone-Poulenc Rorer Company, France, was used as received.
(2) 99.7%, Synthesis grade, Siciete de Distribution de Service et de Recherche, France, was used as received.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3.5% between 283.15 K and 293.15; 12% at 303.15 K (relative error).

15.9. Ketoprofen solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) (9Z)-Octadecenoic acid (Oleic acid); $C_{18}H_{34}O_2$; [112-80-1]	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 0.0944$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Reagent grade, chemical source not specified, was used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±17% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Mineral oil	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 0.000747$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed and filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±50% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000503$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sankyo, Pfaffenhofen, Germany, no purification details were provided.
(2) Purity not given, Bayer Leverkusen and Rhone Poulenc Rorer, Cologne, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Mineral oil	[143]M. T. J. Garcia, C. H. Tomich de Paula da Silva, D. C. R. de Oliveira, E. C. A. Braga, J. A. Thomazini, and M. V. L. B. Gently, Pharm. Res. **23**, 1776 (2006).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000465$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at ambient room temperature with constant stirring for 24 h. The suspension was then centrifuged for 10 min, and an aliquot of the supernatant was removed for analysis. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent or HPLC grade, Merck Chemical Company, Darmstadt, Germany, no purification details were provided.

Estimated Error:
Temperature: Insufficient details given in the paper.
c_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Peanut oil	[135]Y.-J. Cho and H.-K. Choi, Int. J. Pharm. **169**, 95 (1998).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured molar solubility was reported to be $c_1 = 0.0307$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in a screw-capped vial. The contents were stirred by an externally driven teflon-coated magnetic bar at ambient room temperature until equilibrium was obtained. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA). The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Jeil Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Purity not given, Croda, Parsippany, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
x_1: ±26% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Castor oil	[92]D. B. Larsen, H. Parshad, K. Fredholt, and C. Larsen, Int. J. Pharm. **232**, 107 (2002).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.377$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped test tube and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, centrifuged at 15 000 rpm for 10 min, and diluted quantitatively with ethanol for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Polyethylene glycol 400 (PEG 400)	[140]G. V. Vittal, R. Deveswaran, S. Bharath, B. V. Basavaraj, and V. Madhavan, Int. J. Pharm. Invest. **2**, 150 (2012).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 3000$ mg cm^{-3}. Note: It is not apparent from reading the paper whether the amount dissolved is per cm^3 of saturated solution or per cm^3 of solvent.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were placed in volumetric flask and then allowed to equilibrate at ambient room temperature in a water shaker bath for 48 h under continued vibration. An aliquot of the saturated solution was removed, filtered through 0.45 μm membrane filter (Millipore, Bedford, Massachusetts, USA), and diluted for spectrophotometric analysis at 260 nm. The reported value represents the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Yarrow Chem Products, Mumbai, India, no purification details were provided.
(2) Purity not given, E. Merck Chemical Company Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±12% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Benzoyl-α-methylbenzeneacetic acid ((±)-Ketoprofen); $C_{16}H_{14}O_3$; [22071-15-4] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.955$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

16. Solubility of Ketorolac in Organic Solvents

16.1. Critical evaluation of experimental solubility data

Ketorolac (more formally named 5-benzoyl-2,3-dihydro-1*H*-pyrrolizine-1-carboxylic acid) is a member of the pyrrolo-pyrrole class of NSAIDs. The drug is available in several different formulations (oral, intravenous, and intramuscular) and has been used effectively in pain management therapies. New formulations are continually being investigated. Intranasal ketorolac has been shown to provide short-term relief for individuals suffering from postoperative pain. Ophthalmic solutions have been used to reduce ocular pain and inflammation. There have been two publications[149,150] reporting the solubility of ketorolac in organic solvents. Doh *et al.*[149] determined the molar solubility of ketorolac and seven alkyl ester prodrugs (methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl ester) in water, 1,2-propanediol, and isotonic phosphate buffer at 310 K as part of an experimental study involving transdermal delivery and rat skin permeation. The authors found that the skin permeation rate of the alkyl ester prodrugs was significantly higher with a shorter lag time than that of ketorolac. A followup study performed by Kim *et al.*[150] examined the transdermal ketorolac amide prodrugs. The solubility of ketorolac in 1,2-propanediol was reported again in this second study. It is not possible to perform a critical evaluation of the experimental data as measurements were made at one temperature and there are no independent experimental solubility data for ketorolac in 1,2-propanediol.

The experimental solubility data for ketorolac dissolved in 1,2-propanediol are given in Sec. 16.2.

16.2. Ketorolac solubility data in alcohols

Components:	Original Measurements:
(1) 5-Benzoyl-2,3-dihydro-1*H*-pyrrolizine-1-carboxylic acid ((±)-Ketorolac); $C_{15}H_{13}NO_3$; [74103-06-3]	[149]H.-J. Doh, W.-J. Cho, C.-S. Yong, H.-G. Choi, J. S. Kim, C.-C. Lee, and D. D. Kim, J. Pharm. Sci. **92**, 1008 (2003).
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[150]B.-Y. Kim, H.-J. Doh, T. N. Le, W.-J. Cho, C.-S. Yong, H.-G. Choi, J. S. Kim, C.-H. Lee, and D.-D. Kim, Int. J. Pharm. **293**, 193 (2005).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.05285$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and a high-performance liquid chromatograph.
Very few experimental details were provided. Excess solute was added to 1 cm^3 of 1,2-propanediol. The solution was placed in a constant-temperature water bath and stirred for 24 h to reach equilibrium. The sample was withdrawn and filtered through a Minisart RC 4 filter (0.45 μm, from Satorius, Germany). The filtrate was diluted with methanol. The concentration of the dissolved solute was determined by high-performance liquid chromatographic (HPLC) analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: No information was given.
c_1: ±0.00595.

17. Solubility of Lornoxicam in Organic Solvents

17.1. Critical evaluation of experimental solubility data

Lornoxicam (more formally named 6-chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide) is a NSAID drug possessing potent analgesic and anti-inflammatory properties. The drug is prescribed in the treatment of pain resulting from osteoarthritis, sciatica, and inflammatory diseases of the joints. There have been three publications[151–153] reporting the solubility of lornoxicam in organic solvents. Kharwade *et al.*[152] determined the molar solubility of lornoxicam in ethanol at 288 K. Reference 151 examined the solubility of lornoxicam in two saturated hydrocarbons (hexane and cyclohexane), in two aromatic hydrocarbons (benzene and methylbenzene), in two alkyl alkanoates (ethyl ethanoate and butyl ethanoate), in one cyclic ether (1,4-dioxane), in two chloroalkanes (trichloromethane and tetrachloromethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), in nine alcohols (methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 2-methyl-1-propanol, 1-pentanol, 1-octanol, 1,2-propanediol, and 1,2,3-propanetriol), in one alkanone (propanone) and one aromatic ketone (acetophenone), and in three miscellaneous organic solvents (dimethyl sulfoxide, *N*,*N*-dimethylformamide, and benzenamine) at 298 K and atmospheric pressure. Lee and Chun[153] investigated the effects of various vehicles and fatty acids on the *in vitro* transdermal permeation of lornoxicam using hairless dorsal skin and human cadaver full skin. As part of their investigation, they determined the solubility in ethanol, propylene glycol, polyethylene glycol 400, dimethyl sulfoxide, isopropyl myristate, and *N*-methylpyrrolidone at 305 K. It is not possible to perform a critical evaluation of the experimental data as there are not sufficient independent experimental solubility data for lornoxicam in the aforementioned solvents.

The experimental solubility data for lornoxicam in organic solvents are given in Secs. 17.2–17.9.

17.2. Lornoxicam solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000000223

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000640

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.3. Lornoxicam solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Benzene; C_6H_6; [71-43-2]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000905

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Methylbenzene; C_7H_8; [108-88-3]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000392

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.4. Lornoxicam solubility data in esters

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000109

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Butyl ethanoate; $C_6H_{12}O_2$; [123-86-4]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000943

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00011$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

17.5. Lornoxicam solubility data in ethers

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000191

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.6. Lornoxicam solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9993	0.000660

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Tetrachloromethane; CCl_4; [56-23-5]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000277

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000142

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.7. Lornoxicam solubility data in alcohols

Components:	**Original Measurements:**
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Methanol; CH_4O; [67-56-1]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000126

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Ethanol; C_2H_6O; [64-17-5]	[152]M. Kharwade, G. Archyuto, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Solution Chem. **41**, 1364 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000013

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Orbital shaking incubator and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in stoppered flasks and allowed to equilibrate for three days at constant temperature in an orbital shaking incubator. Aliquots of saturated solutions were filtered to remove the undissolved solute, and then diluted with 0.05 mol dm^{-3} for spectroscopic analysis. Concentration was determined by spectrophotometric measurements at 264 nm. Solubility measurement was conducted in triplicate.

Source and Purity of Chemicals:
(1) Purity not given, Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K.
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Ethanol; C_2H_6O; [64-17-5]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000133

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Ethanol; C_2H_6O; [64-17-5]	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000377$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1-Propanol; C_3H_8O; [71-23-8]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000225

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 2-Propanol; C_3H_8O; [67-63-0]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000121

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000139

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000119

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000385

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000212

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000304

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000323$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.00000540

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.8. Lornoxicam solubility data in ketones

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Propanone; C_3H_6O; [67-64-1]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000813

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Acetophenone; C_8H_8O; [98-86-2]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9992	0.000779

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

17.9. Lornoxicam solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9983	0.00173

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0325$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9988	0.00115

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Benzenamine; C_6H_7N; [62-53-3]	[151]M. Kharwade, C. V. S. Subrahmanyam, and P. R. S. Babu, J. Pharm. Res. **7**, 409 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9974	0.00263

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature orbital shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature reciprocating shaker bath for at least three days. An aliquot of the saturated solution was removed, filtered, and then diluted with a 0.05 molar sodium chloride solution. Solubility of the dissolved solute was determined by spectrophotometric measurements at 376 nm.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Hetero Drugs, Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, S. D. Fine Chemicals Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) *N*-Methyl-2-pyrrolidone; C_5H_9NO; [872-50-4]	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0328$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 6-Chloro-4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Lornoxicam); $C_{13}H_{10}ClN_3O_4S_2$; [70374-39-9] (2) Polyethylene glycol 400 (PEG 400)	[153]J. H. Lee and I. K. Chun, J. Pharm. Invest. **42**, 235 (2012).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00761$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
High-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at constant temperature with shaking for 48 h. The saturated solution was removed and quickly filtered (0.45 μm filter). The concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis after appropriate dilution with an aqueous methanol solution.

Source and Purity of Chemicals:
(1) Purity not given, Hyundai Pharmaceutical Company, Seoul, South Korea, no purification details were provided.
(2) Analytical Reagent grade, Chemical source not provided, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

18. Solubility of Mefenamic Acid in Organic Solvents

18.1. Critical evaluation of experimental solubility data

Mefenamic acid (more formally named 2-[(2,3-dimethylphenyl)amino]benzoic acid) is a NSAID that is prescribed for dysmenorrhea and to treat pain and inflammation caused by arthritis. There have been four publications[65,88,154,155] reporting the solubility of mefenamic acid in organic solvents. Lee *et al.*[88] measured the mole fraction solubility of mefenamic acid in cyclohexane, methylbenzene, and ethanol at 298 K. The measurements were performed as part of a larger study that examined the effect that a cosolute had on the solubility of the main solute. In this particular study, flufenamic acid served as the cosolute and mefenamic acid was the main drug solute. Swathi *et al.*[154] determined the molar solubility of mefenamic acid in ethanol, 1,2-ethanediol, 1,2-propanediol, 1,2,3-propanetriol, and polyethylene glycol 400. The five solvents are often used as vehicles and enhancers in skin penetration studies. Ethanol is the only solvent common to both studies. The solubility data were published in different concentration units. Using a value of 0.05870 l mol^{-1} for the molar volume of ethanol, the measured mole fraction solubility of $x_1 = 0.00168$ of Lee *et al.*[88] is converted to a molar solubility of $c_1 = 0.0286$ mol dm^{-3}, which differs significantly from the value of $c_1 = 0.06127$ mol dm^{-3} reported by Swathi *et al.* Rytting *et al.*[65] reported the solubility of mefenamic acid in polyethylene glycol 400 (PEG 400) at ambient room temperature.

Mudalip *et al.*[155] measured the solubility of mefenamic acid in three hydrocarbons (hexane, heptane, and cyclohexane), in one alkyl alkanoate (ethyl ethanoate), in two alcohols (ethanol and 2-propanol), and in two miscellaneous organic solvents (*N*,*N*-dimethylformamide and *N*,*N*-dimethylacetamide) at six different temperatures from 298 to 323 K. The internal consistency of the eight datasets was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 11, along with the mean absolute relative deviation. Each of the eight data sets is considered internally consistent as evidenced by the small MARD values.

The experimental solubility data for mefenamic acid in organic solvents are given in Secs. 18.2–18.7.

TABLE 11. Parameters of the Modified Apelblat equation for describing the solubility of mefenamic acid in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Hexane[a]	298–323	−52.123	114.678	7.909	2.3
Heptane[a]	298–323	−55.447	114.609	8.473	2.5
Cyclohexane[a]	298–323	−52.886	114.672	7.974	3.2
Ethyl ethanoate[a]	298–323	−73.205	114.222	11.806	2.4
Ethanol[a]	298–323	−70.431	114.292	11.184	4.7
2-Propanol[a]	298–323	−75.784	114.180	12.137	4.8
Propanone[a]	298–323	−51.389	114.730	8.025	3.6
N,*N*-Dimethylformamide[a]	298–323	−86.491	113.952	14.397	3.6
N,*N*-Dimethylacetamide[a]	298–323	−35.101	115.100	5.729	1.6

[a]Data set from Mudalip *et al.*[155]

18.2. Mefenamic acid solubility data in saturated hydrocarbons (including cycloalkanes)

Components:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]
(2) Hexane; C_6H_{14}; [110-54-3]

Original Measurements:
[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9987	0.0013
303	0.9986	0.0014
308	0.9984	0.0016
313	0.9982	0.0018
318	0.9980	0.0020
323	0.9976	0.0024

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99.9%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]
(2) Heptane; C_7H_{16}; [142-82-5]

Original Measurements:
[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9989	0.0011
303	0.9987	0.0013
308	0.9985	0.0015
313	0.9983	0.0017
318	0.9982	0.0018
323	0.9978	0.0022

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9991	0.0009
303	0.9991	0.0009
308	0.9989	0.0011
313	0.9988	0.0012
318	0.9986	0.0014
323	0.9984	0.0016

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000029

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

18.3. Mefenamic acid solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Methylbenzene; C_7H_8; [108-88-3]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9996	0.00037

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Mallinckrodt Baker, Inc., Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

18.4. Mefenamic acid solubility data in esters

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9961	0.0039
303	0.9955	0.0045
308	0.9945	0.0055
313	0.9929	0.0071
318	0.9921	0.0079
323	0.9904	0.0096

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99.5%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

18.5. Mefenamic acid solubility data in alcohols

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Ethanol; C_2H_6O; [64-17-5]	[88]E. H. Lee, S. R. Byrn, and R. Pinal, J. Pharm. Sci. **101**, 4529 (2012).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9983	0.00168

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature refrigerated water bath and a high-performance liquid chromatograph equipped with a photodiode array detector.
Excess solute and solvent were dissolved in glass vials and placed in jacketed beakers connected to a refrigerated water bath. Solutions were stirred using magnetic stirrers for a minimum of 24 h. The saturated solutions were filtered (0.20 μm pore size) and diluted to a concentration suitable for high-performance liquid chromatographic analysis. Samples were analyzed at a wavelength of 280 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Pharmco, Brookfield, Connecticut, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±2.5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Ethanol; C_2H_6O; [64-17-5]	[154]C. H. Swathi, C. V. S. Subrahmanyam, S. A. Kedarnath, and P. R. S. Babu, Int. J. Pharm. Technol. **3**, 3267 (2011).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.06127$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 333 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Wanbury Ltd., no purification details were given in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Ethanol; C_2H_6O; [64-17-5]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9981	0.0019
303	0.9980	0.0020
308	0.9976	0.0024
313	0.9968	0.0032
318	0.9963	0.0037
323	0.9958	0.0042

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99.9%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) 2-Propanol; C_3H_8O; [67-63-0]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9980	0.0020
303	0.9976	0.0024
308	0.9974	0.0026
313	0.9967	0.0033
318	0.9960	0.0040
323	0.9947	0.0053

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99.9+%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[154]C. H. Swathi, C. V. S. Subrahmanyam, S. A. Kedarnath, and P. R. S. Babu, Int. J. Pharm. Technol. **3**, 3267 (2011).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000911$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 333 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Wanbury Ltd., no purification details were given in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[154]C. H. Swathi, C. V. S. Subrahmanyam, S. A. Kedarnath, and P. R. S. Babu, Int. J. Pharm. Technol. **3**, 3267 (2011).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000907$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 333 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Wanbury Ltd., no purification details were given in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[154]C. H. Swathi, C. V. S. Subrahmanyam, S. A. Kedarnath, and P. R. S. Babu, Int. J. Pharm. Technol. **3**, 3267 (2011).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000648$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 333 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Wanbury Ltd., no purification details were given in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

18.6. Mefenamic acid solubility data in ketones

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7] (2) Propanone; C_3H_6O; [67-64-1]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9946	0.0054
303	0.9945	0.0055
308	0.9935	0.0065
313	0.9930	0.0070
318	0.9916	0.0084
323	0.9902	0.0098

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99.5%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

18.7. Mefenamic acid solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
(2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.9829	0.0171
303	0.9792	0.0208
308	0.9725	0.0275
313	0.9673	0.0327
318	0.9609	0.0391
323	0.9449	0.0551

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]	[155]S. K. A. Mudalip, M. R. A. Bakar, P. Jamal, and F. Adam, J. Chem. Eng. Data **58**, 3447 (2013).
(2) *N*,*N*-Dimethylacetamide; C_4H_9NO; [127-19-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
298	0.8781	0.1219
303	0.8623	0.1377
308	0.8465	0.1535
313	0.8352	0.1648
318	0.8247	0.1753
323	0.8099	0.1901

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled shaker bath and analytical balance.
Excess solute and solvent were placed in sealed glass vials and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot was removed and filtered using a 0.45 μm membrane filter. The supernatant was transferred into a tared evaporating dish. The evaporating dish with saturated solution was weighed to determine the amount of sample analyzed. The solvent was evaporated initially for several hours at room temperature and then at 333 K. The evaporating dish with solid residue was repeatedly weighed and dried until constant weight was achieved. The solubility was calculated from the mass of the solid residue and the weight of the sample analyzed. Experimental solubilities represent the average of three replicated measurements.

Source and Purity of Chemicals:
(1) 98%, Baoji Tianxin Pharmaceutical Company, Ltd., China, was used as received.
(2) 99%, Fisher Scientific, USA, was used as received.

Estimated Error:
Temperature: ±1 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]	[154]C. H. Swathi, C. V. S. Subrahmanyam, S. A. Kedarnath, and P. R. S. Babu, Int. J. Pharm. Technol. **3**, 3267 (2011).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.04770$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 333 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Wanbury Ltd., no purification details were given in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-[(2,3-Dimethylphenyl)amino]-benzoic acid (Mefenamic acid); $C_{15}H_{15}NO_2$; [61-68-7]	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0883$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

19. Solubility of Meloxicam in Organic Solvents

19.1. Critical evaluation of experimental solubility data

Meloxicam (more formally named 4-hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide) has been used to manage pain, stiffness, swelling, and tenderness caused by osteoarthritis and rheumatoid arthritis. There have been several publications[67,156–159] reporting the solubility of meloxicam in organic solvents. Most notably, Babu *et al.*[156] measured the mole-fraction solubility of meloxicam in 25 different organic solvents, including two saturated hydrocarbons (hexane and cyclohexane), two aromatic hydrocarbons (benzene and methylbenzene), two alkyl alkanoates (ethyl ethanoate and butyl ethanoate), one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and tetrachloromethane), 12 alcohols (methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, 1-octanol, benzenemethanol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and two miscellaneous organic solvents (dimethyl sulfoxide and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Reference 157 also reported molar meloxicam solubility data in ethanol, 1,3-propanediol, polyethylene glycol 300 (PEG 300), and polyethylene glycol 400 (PEG 400), as well as in binary ethanol + PEG 400 and 1,2-propanediol + PEG 400 solvent mixtures. Seedher and Bhatia[67] determined the molar solubility of meloxicam in methanol, ethanol, 1-butanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, 1,2,3-propanetriol, and polyethylene glycol 400 (PEG 400) at 298 K. Meloxicam solubilities were also measured in binary ethanol + 1,2,3-propanetriol and ethanol + PEG 400 solvent mixtures.

There have been two studies[158,159] reporting the solubility of the analgesic drug meloxicam in organic solvents as a function of temperature. Holguín *et al.*[159] examined the solubility behavior and preferential solvation in binary water + 1,2-propanediol mixtures at several temperatures from 293 to 313 K. Delgado *et al.*[158] performed similar solubility measurements in binary aqueous-ethanol solvent mixtures. In both cases, the authors determined the solubility of meloxicam in water and in the neat organic solvent. The internal consistency of the two datasets was assessed by curve-fitting the measured mole-fraction solubility data to the Modified Apelblat model [Eq. (8)] to yield the following representations:

$$\ln x_1 = -131.031 + \frac{114.212}{T} + 21.086 \ln T \qquad (31)$$

$$\ln x_1 = -73.046 + \frac{115.550}{T} + 10.983 \ln T \qquad (32)$$

for solubilities in ethanol and 1,2-propanediol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (31) and (32) of MARD = 2.5% and MARD = 1.3% are less than the experimental uncertainty associated with the measured values.

The experimental solubility data for meloxicam in organic solvents are given in Secs. 19.2–19.10.

19.2. Meloxicam solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Hexane; C_6H_{14}; [110-54-3]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.00000770

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.00000447

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.3. Meloxicam solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Benzene; C_6H_6; [71-43-2]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000161

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Methylbenzene; C_7H_8; [108-88-3]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000170

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.4. Meloxicam solubility data in esters

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000348

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Butyl ethanoate; $C_6H_{12}O_2$; [123-86-4]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9996	0.000396

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.5. Meloxicam solubility data in ethers

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9982	0.001796

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.6. Meloxicam solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2H-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9982	0.001814

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Tetrachloromethane; CCl_4; [56-23-5]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000617

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.7. Meloxicam solubility data in alcohols

Components:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7]
(2) Methanol; CH_4O; [67-56-1]

Original Measurements:
[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000564

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7]
(2) Methanol; CH_4O; [67-56-1]

Original Measurements:
[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00109$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2H-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7]
(2) Ethanol; C_2H_6O; [64-17-5]

Original Measurements:
[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00101$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethanol; C_2H_6O; [64-17-5]	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000698$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethanol; C_2H_6O; [64-17-5]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000458

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethanol; C_2H_6O; [64-17-5]	[158]D. R. Delgado, A. R. Holguín, O. A. Almanza, F. Martínez, and Y. Marcus, Fluid Phase Equilib. **305**, 88 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9999	0.0000188
298.15	0.9999	0.0000272
303.15	0.9999	0.0000412
308.15	0.9999	0.0000541
313.15	0.9999	0.0000735

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker bath, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a stoppered dark glass flask and allowed to equilibrate with stirring in a thermostatic mechanical shaker bath (for measurements at 303.15, 308.15, and 313.15 K), or in a recirculating thermostatic bath (for measurements at 293.15 and 298.15 K) for at least seven days. An aliquot of the saturated solution was removed, isothermally filtered, and diluted quantitatively for spectrophotometric analysis. The reported values represent the average of at least three determinations.

Source and Purity of Chemicals:
(1) 99.8%, chemical source not specified, no purification details were given in the paper.
(2) 99.8%, Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±3% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Propanol; C_3H_8O; [71-23-8]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000556

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 2-Propanol; C_3H_8O; [67-63-0]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000393

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000880

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000811$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000109

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.000138

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000226

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000532$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9997	0.000309

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Benzenemethanol; C_7H_8O; [100-51-6]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9982	0.00184

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000267$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000874$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.0000815

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000993$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[159]A. R. Holguín, D. R. Delgado, F. Martínez and Y. Marcus, J. Solution Chem. **40**, 1987 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9999	0.0000356
298.15	0.9999	0.0000420
303.15	0.9999	0.0000484
308.15	0.9999	0.0000598
313.15	0.9999	0.0000713

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in dark stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker (for 303.15, 308.15, and 313.15 K) or recirculating thermostatic bath (for 293.15 and 298.15 K) for at least seven days. An aliquot of the saturated solution was withdrawn and filtered to remove any particulate matter. Concentrations were determined by spectrophotometric measurements. Experimental determinations were performed in at least triplicate.

Source and Purity of Chemicals:
(1) 99.8%, chemical source not specified, no purification details were provided in the paper.
(2) 99.8%, chemical source not specified, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9999	0.00000339

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000393$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

19.8. Meloxicam solubility data in ketones

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Propanone; C_3H_6O; [67-64-1]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9994	0.000606

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Acetophenone; C_8H_8O; [98-86-2]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9977	0.00229

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

19.9. Meloxicam solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9945	0.00550

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1,2-benzothiazine-3-carboxamide-1,1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[156]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Pak. J. Pharm. Sci. **20**, 311 (2007).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9841	0.01585

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate in a constant-temperature shaker bath for at least three days. An aliquot of the saturated solution was removed and filtered (0.20 μm pore size). Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, gift sample from Dr. Reddy Labs., Hyderabad, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Polyethylene glycol 300 (PEG 300)	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.01816$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Polyethylene glycol 400 (PEG 400)	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.01992$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0107$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sun Pharmaceutical Industries, Ltd., Mumbai, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

19.10. Meloxicam solubility data in binary organic solvent mixtures

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Polyethylene glycol 400 (PEG 400) (3) Ethanol; C_2H_6O; [64-17-5]	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).

Variables:	Prepared by:
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.000698
0.20	0.005166
0.40	0.009117
0.60	0.01435
0.80	0.01854
0.90	0.01947
1.00	0.01992

[a] $v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b] c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethanol; C_2H_6O; [64-17-5] (3) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).

Variables:	Prepared by:
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.01071
0.10	0.01145
0.20	0.01093
0.40	0.00777
0.60	0.00458
0.80	0.00223
1.00	0.00101

[a] $v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b] c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Polyethylene glycol 400 (PEG 400) (3) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[157]P. R. S. Babu, C. V. S. Subrahmanyam, J. Thimmasetty, R. Manavalan, and K. Valliappan, Ethiop. Pharm. J. **25**, 23 (2007).

Variables:	Prepared by:
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.000993
0.20	0.003320
0.40	0.006840
0.60	0.01037
0.80	0.01559
0.90	0.01919
1.00	0.01992

[a] $v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b] c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and an UV/visible spectrophotometer. Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in stoppered volumetric flasks and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter, and diluted with 0.1 molar aqueous hydrochloric acid solution for spectroscopic analysis at 345 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Reddy Labs, Hyderabad, India, no purification details were given in the paper.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1.0 K (estimated by compiler).
$v_2^{(s)}$: ±0.01.
c_1: ±10.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(5-methyl-2-thiazolyl)-2*H*-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide (Meloxicam); $C_{14}H_{13}N_3O_4S_2$; [71125-38-7] (2) Ethanol; C_2H_6O; [64-17-5] (3) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.000393
0.10	0.000848
0.20	0.001116
0.40	0.001147
0.60	0.001377
0.80	0.001158
0.90	0.001059
1.00	0.001007

[a] $v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b] c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 10% aqueous *N*,*N*-dimethylformamide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 363 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

20. Solubility of Nabumetone in Organic Solvents

20.1. Critical evaluation of experimental solubility data

Nabumetone (more formally named 4-(6-methoxy-2-naphthyl)-2-butanone) is a nonacidic nonsteroidal anti-inflammatory prodrug that reduces pain and inflammation by selectively blocking COX-2 activity. The drug is converted in the liver to 6-methoxy-2-napthylacetic acid which is the principal metabolite responsible for the observed therapeutic effect.[160] Nabumetone is used by physicians in the treatment of individuals suffering from arthritis. There have been only two publications[64,161] reporting the solubility of nabumetone in organic solvents. Rathi *et al.*[161] determined the mole fraction solubility of nabumetone in 1,4-dioxane at 298 K. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. It is not possible to perform a critical evaluation of the experimental data as measurements were made at only one temperature and there are no independent experimental solubility data for nabumetone in either 1,4-dioxane or mineral oil.

The experimental solubility data for nabumetone in organic solvents are given in Secs. 20.2 and 20.3.

20.2. Nabumetone solubility data in ethers

Components:	**Original Measurements:**
(1) 4-(6-Methoxy-2-naphthyl)-2-butanone (Nabumetone); $C_{15}H_{16}O_2$; [42924-53-8] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[161]P. B. Rathi, K. V. Deshpande, P. S. Panzade, and I. Roul, Asian J. Biomed. Pharm. Sci. **3**, 33 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2 [a]	x_1 [b]
0.9947	0.00526

[a] x_2: mole fraction of component 2 in the saturated solution.
[b] x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped vials allowed to equilibrate submerged with shaking at constant temperature for 24 h. An aliquot of the saturated solution was removed and filtered through Whatman filter paper (No. 42). Solubility of the dissolved solute was determined by spectrophotometric measurements at 262 nm.

Source and Purity of Chemicals:
(1) Purity not given, GlaxoSmithKline Pharmaceuticals, Ltd., Nasik, India, no purification details were provided.
(2) Purity not given, Research Lab Fine Chemical Industry, Islampur, India, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

20.3. Nabumetone solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 4-(6-Methoxy-2-naphthyl)-2-butanone (Nabumetone); $C_{15}H_{16}O_2$; [42924-53-8]	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
(2) Mineral oil	
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0154$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, SmithKline Beecham, Worthing, Great Britain, no purification details were provided.
(2) Purity not given, Bayer Leverkusen and Rhone Poulenc Rorer, Cologne, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

21. Solubility of Naproxen in Organic Solvents

21.1. Critical evaluation of experimental solubility data

Naproxen (more formally named (S)-6-methoxy-α-methyl-2-naphthaleneacetic acid) is a nonselective NSAID and is used to relieve pain and inflammation associated with kidney stones, gout, dysmenorrhea, bursitis, tendinitis, osteoarthritis, psoriatic arthritis, and rheumatoid arthritis. Lejal *et al.*[162] found that naproxen protected Madin-Darby canine cells against HqN1 and H3N2 viral strains, and that naproxen decreased the viral titers in mice lungs after intranasal viral infection. There have been several studies[64,65,92,111,117,163–170] involving the solubility of naproxen in organic solvents. Perlovich *et al.*[163] measured naproxen solubilities in hexane, benzene, methanol, ethanol, 1-propanol, 1-butanol, 1-pentanol, 1-heptanol, and 1-octanol at 298 K based on spectroscopic methods. Bustamante *et al.*[164] reported solubility data for naproxen at 298 K in two saturated hydrocarbons (heptane and cyclohexane), in one aromatic hydrocarbon (benzene), in one alkyl alkanoate (ethyl ethanoate), in one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), in two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), in six alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-propanediol, and 1,2,3-propanetriol), in one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide). Daniels *et al.*[165] determined the solubility of naproxen in two alkyl alkanoates (methyl ethanoate and butyl ethanoate), in three dialkyl ethers (1,1-oxybisethane, 2,2′-oxybispropane, and 1,1′-oxybisbutane), and two cyclic ethers (tetrahydrofuran and 1,4-dioxane), and in 12 alcohols (1-propanol, 2-propanol, 1-butanol, 2-butanol, 2-methyl-1-propanol, 1-pentanol, 2-pentanol, 3-methyl-1-butanol, 1-hexanol, 1-heptanol, 1-octanol, and 1-decanol) at 298 K. Manrique *et al.*,[111] Yan *et al.*,[168] Fini *et al.*,[60] Mora and Martínez,[167] Claramonte *et al.*,[170] and Aragón *et al.*[166,169] have also performed naproxen solubility measurements at 298 K. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K.

Daniels *et al.*[165] used their measured solubility data for naproxen in ethyl ethanoate, 1,1′-oxybisethane, and 12 alcohol solvents, combined with published solubility and partition coefficient data, to calculate the Abraham solute descriptors of naproxen. The authors were able to assemble a total of 40 $\log_{10}(SR$ or $P)$ and $\log_{10}(GSR$ or $K)$ equations for which experimental partition coefficient data, solubility ratios, Abraham Model equation coefficients, and aqueous molar solubility were

available. The logarithm of the aqueous molar solubility of naproxen is $\log_{10}c_{1,W} = -4.16$ (corrected for ionization).[60] Other published values for the aqueous molar solubility of naproxen include $\log_{10}c_{1,W} = -4.216$ (Ref. 147) and $\log_{10}c_{1,W} = -4.20$.[118,119] The McGowan volume of ibuprofen, $V = 1.7821$, was calculated from the number of chemical bonds in the molecule and the individual atomic group volumes, AV_i, given in Sec. 1.3. The excess molar refraction solute descriptor was estimated as $E = 1.510$. This left four solute descriptors (S, A, B, and L) still to be determined. The 40 equations were then solved using the Microsoft "SOLVER" program to yield numerical values of the remaining four solute descriptors, $S = 2.022$, $A = 0.600$, $B = 0.673$, and $L = 9.207$, that best described the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) values. The computation treated $\log_{10}c_{1,G}$ as a floating parameter to be determined as part of the regression analyses. The data analyses returned a value of $\log_{10}c_{1,G} = -12.96$ for the logarithm of the gas-phase solute concentration that made the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) predictions internally consistent. The calculated molecular solute descriptors reproduced the $\log_{10}$(*SR* or *P*) and $\log_{10}$(*GSR* or *K*) values to within an average standard deviation of 0.075 and 0.071 $\log_{10}$ units, respectively.

Table 12 compares the experimental $\log_{10}c_1$ values to calculated values based on Eqs. (28) and (29) of the Abraham model. For comparison purposes, the measured mole fraction solubilities of naproxen, x_1, determined by Daniels *et al.*[165] were converted into molar solubilities by dividing x_1 by the ideal molar volume of the saturated solution (i.e., $c_1^{sat} = x_1/[x_1V_1 + (1-x_1)V_{solvent}]$. The molar volume of the hypothetical subcooled liquid naproxen is $V_{solute} = 198.70\ cm^3\ mol^{-1}$. Examination of the numerical entries in Table 12 reveals that the Abraham model provides a reasonably accurate mathematical description for much of the observed solubility. The comparison did identify the experimental solubility of naproxen in diethyl ether determined by Bustamante *et al.*[166] as a suspected outlier value, as well as the solubility of naproxen in propanone reported by Yan *et al.*[167] Both values differ significantly from the predicted $\log_{10}c_1$ value and from at least one other independently measured molar solubility for naproxen dissolved in the respective organic solvent.

There have been five studies[60,111,166–168] reporting the solubility of naproxen as a function of temperature. Fini *et al.*[60] determined the molar solubility of naproxen in 1-octanol at only three temperatures from 278 to 310 K. Mora and Martínez[167] measured the solubility of naproxen in cyclohexane, 1-methylethyl tetradecanoate, trichloromethane, and 1-octanol at several temperatures from 293 to 313 K. Aragón *et al.*[166] examined the solubility behavior of naproxen in ethyl ethanoate, dichloromethane, propanone and ethanenitrile in the temperature range of 293–313 K. Manrique *et al.*[111]

TABLE 12. Comparison between observed and predicted molar solubilities of naproxen based on the Abraham model, Eqs. (28) and (29)

Solvent	$\log_{10}c_1^{calc}$; Eq. (28)	$\log_{10}c_1^{calc}$; Eq. (29)	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$	$\log_{10}c_1^{exp}$
Methanol	−0.712	−0.652	−0.470[a]	−0.531[b]	−0.691[c]
Ethanol	−0.616	−0.747	−0.486[a]	−0.780[c]	−0.611[d]
1-Propanol	−0.769	−0.841	−0.770[e]	−0.798[c]	
2-Propanol	−0.744	−0.774	−0.770[e]	−0.829[b]	
1-Butanol	−0.962	−0.784	−0.820[e]	−0.828[c]	
2-Butanol	−0.761	−0.775	−0.820[e]		
2-Methyl-1-propanol	−0.951	−0.919	−1.030[e]		
1-Pentanol	−0.917	−0.847	−0.848[e]	−0.546[a]	−0.874[c]
2-Pentanol	−0.959	−0.915	−0.867[e]		
3-Methyl-1-butanol	−0.986	−0.941	−0.964[e]		
1-Hexanol	−0.848	−0.835	−0.881[e]	−0.882[c]	
1-Heptanol	−0.897	−0.954	−0.875[e]	−0.874[c]	
1-Octanol	−0.919	−0.991	−0.996[e]	−0.980[a]	−1.037[c]
			−0.936[f]	−0.960[g]	
1-Decanol	−1.078	−1.053	−1.070[e]		
1,1′-Oxybisethane	−0.778	−0.880	−0.730[e]	−1.573[a]	
Tetrahydrofuran	0.277	0.223	0.200[e]		
1,4-Dioxane	0.151	0.130	0.030[e]	0.238[a]	
Methyl ethanoate	−0.365	−0.338	−0.481[e]		
Ethyl ethanoate	−0.537	−0.521	−0.634[e]	−0.460[a]	−0.584[h]
			−0.582[b]		
Propyl ethanoate	−0.563	−0.555			
Butyl ethanoate	−0.625	−0.630	−0.758[e]		
Propanone	−0.176	−0.194	−0.077[a]	−0.202[h]	−1.423[b]

[a]Experimental value from Bustamante *et al.*[164]
[b]Experimental value from Yan *et al.*[168]
[c]Experimental value from Perlovich *et al.*[163]
[d]Experimental value from Aragón *et al.*[169]
[e]Experimental value from Daniels *et al.*[165]
[f]Experimental value from Fini *et al.*[60]
[g]Experimental value from Mora and Martínez.[167]
[h]Experimental value from Aragón, Rosas, and Martínez.[166]

TABLE 13. Parameters of the Modified Apelblat equation for describing the solubility of naproxen in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Cyclohexane[a]	293–313	−142.252	112.669	23.181	3.9
Ethyl ethanoate[b]	293–313	−42.558	114.950	6.764	0.4
Ethyl ethanoate[c]	278–320	−56.145	114.690	9.150	0.4
1-Methylethyl tetradecanoate[a]	293–313	−60.494	114.550	9.671	1.2
Dichloromethane[b]	293–313	−94.370	113.787	15.761	1.3
Trichloromethane[a]	293–313	−64.496	114.523	10.243	1.3
Methanol[c]	278–320	−67.824	114.824	11.069	0.8
Ethanol[c]	278–320	−76.734	114.212	12.615	1.7
2-Propanol[c]	278–320	−73.697	114.280	12.088	0.7
1-Octanol[a]	293–313	−73.586	114.280	12.131	1.9
1,2-Propanediol[d]	293–313	−69.694	114.326	11.302	0.9
Propanone[b]	293–313	−48.718	114.811	7.958	0.3
Propanone[c]	278–320	−73.707	114.258	12.090	0.7
Ethanenitrile[b]	293–313	−91.152	113.854	15.044	1.4

[a]Data set of Mora and Martínez.[167]
[b]Data set of Aragón *et al.*[166]
[c]Data set of Yan *et al.*[168]
[d]Data set of Manrique *et al.*[111]

reported solubility data for naproxen in 1,2-propanediol at several temperatures between 293 and 313 K. Finally, Yan *et al.*[168] studied the solubility of naproxen in five organic solvents (ethyl ethanoate, methanol, ethanol, 2-propanol, and propanone) by incrementally adding small amounts of the solute until no further solid dissolved. The dissolution of the solid was observed using laser monitoring. The internal consistency of the latter 13 datasets was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 13, along with the mean absolute relative deviation. Each of the data sets is considered internally consistent as evidenced by the small MARD values. There were insufficient experimental measurements in the Fini *et al.*[60] dataset to obtain a meaningful regression analysis.

The experimental solubility data for naproxen in organic solvents are found in Secs. 21.2–21.10.

21.2. Naproxen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9990	0.000957

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
(2) Heptane; C_7H_{16}; [142-82-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9982	0.00180

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[167]C. P. Mora and F. Martínez, Fluid Phase Equilib. **255**, 70 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9999	0.0000355
298.15	0.9999	0.0000587
303.15	0.9999	0.0000840
308.15	0.9999	0.0001183
313.15	0.9998	0.0001639

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a constant-temperature water bath for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.000120

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.3. Naproxen solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Benzene; C_6H_6; [71-43-2]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9963	0.00372

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an analytical balance.
Very few experimental details were provided. The solubility was determined with a gravimetric method that involved transferring a weighed aliquot of the saturated solution to a tared container. The solvent was evaporated and the solubility determined from the mass of the solid residue.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Benzene; C_6H_6; [71-43-2]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9928	0.00724

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.4. Naproxen solubility data in esters

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Methyl ethanoate; $C_3H_6O_2$; [79-20-9]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9725	0.02746

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.5%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[166]D. M. Aragón, J. E. Rosas, and F. Martínez, Phys. Chem. Liq. **48**, 437 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9763	0.02370
298.15	0.9737	0.02633
303.15	0.9704	0.02958
308.15	0.9677	0.03234
313.15	0.9638	0.03620

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[168]F.-Y. Yan, L. Chen, D.-Q. Liu, L.-F. SiMa, M.-J. Chen, H. Shi, and J.-X. Zhu, J. Chem. Eng. Data **54**, 1117 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.20	0.9855	0.01447
283.45	0.9828	0.01716
288.15	0.9804	0.01964
293.10	0.9771	0.02294
298.50	0.9729	0.02710
303.25	0.9693	0.03065
308.65	0.9640	0.03603
313.70	0.9585	0.04149
318.70	0.9524	0.04756
320.10	0.9501	0.04986

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Purity grade, Zhejian Chejiu Pharmaceutical Plant, China, dried *in vacuo* at 323 K for 24 h and stored in a desiccator before use.
(2) 99.8+%, Analytical Reagent grade, Tianjin Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±0.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9645	0.0355

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Butyl ethanoate; $C_6H_{12}O_2$; [123-86-4]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9766	0.02342

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.7%, HPLC grade, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[167]C. P. Mora and F. Martínez, Fluid Phase Equilib. **255**, 70 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9943	0.00569
298.15	0.9932	0.00679
303.15	0.9923	0.00766
308.15	0.9908	0.00922
313.15	0.9895	0.01051

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a constant-temperature water bath for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9930	0.0070

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Glyco Iberica, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Methylethyl hexadecanoate; $C_{19}H_{38}O_2$; [142-91-6]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9932	0.0068

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Glyco Iberica, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Dibutyl hexanedioate; $C_{14}H_{26}O_4$; [105-99-7]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9690	0.0310

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Henkel, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Di(2-ethylhexyl) hexanedioate; $C_{22}H_{42}O_4$; [103-23-1]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9830	0.0170

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Aldabo-Julia, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Propylene glycol dipelargonate; $C_{22}H_{42}O_4$; [41395-83-9]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9755	0.0245

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Glyco Iberica, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

21.5. Naproxen solubility data in ethers

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9802	0.01984

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9970	0.00299

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2,2′-Oxybispropane; $C_6H_{14}O$; [108-20-3]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9941	0.00585

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,1′-Oxybisbutane; $C_8H_{18}O$; [142-96-1]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9951	0.00493

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.3%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Tetrahydrofuran; C_4H_8O; [109-99-9]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8582	0.1418

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.9%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.8960	0.1040

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.5%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8157	0.1843

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.6. Naproxen solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Dichloromethane; CH_2Cl_2; [75-09-2]	[166]D. M. Aragón, J. E. Rosas, and F. Martínez, Phys. Chem. Liq. **48**, 437 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9885	0.01145
298.15	0.9844	0.01564
303.15	0.9804	0.01963
308.15	0.9747	0.02531
313.15	0.9680	0.03197

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[167]C. P. Mora and F. Martínez, Fluid Phase Equilib. **255**, 70 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9803	0.0197
298.15	0.9759	0.0241
303.15	0.9728	0.0272
308.15	0.9672	0.0328
313.15	0.9619	0.0381

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a constant-temperature water bath for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9697	0.03029

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9867	0.01329

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9911	0.008891

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.7. Naproxen solubility data in alcohols

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Methanol; CH_4O; [67-56-1]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9914	0.00857

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Methanol; CH_4O; [67-56-1]	[168]F.-Y. Yan, L. Chen, D.-Q. Liu, L.-F. SiMa, M.-J. Chen, H. Shi, and J.-X. Zhu, J. Chem. Eng. Data **54**, 1117 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.20	0.9939	0.006123
283.60	0.9927	0.007293
288.15	0.9913	0.008746
293.10	0.9895	0.010490
298.15	0.9874	0.012570
303.90	0.9846	0.015400
308.65	0.9816	0.018350
313.40	0.9784	0.021590
318.80	0.9745	0.025490
320.15	0.9727	0.027340

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Purity grade, Zhejian Chejiu Pharmaceutical Plant, China, dried *in vacuo* at 323 K for 24 h and stored in a desiccator before use.
(2) 99.8+%, Analytical Reagent grade, Tianjin Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±0.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Methanol; CH_4O; [67-56-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9854	0.01458

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethanol; C_2H_6O; [64-17-5]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9893	0.0107

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) 99.6%, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethanol; C_2H_6O; [64-17-5]	[169]D. M. Aragón, D. P. Pacheco, M. A. Ruidiaz, A. D. Sosnik, and F. Martínez, Vitae, Rev. Fac. Quim. Farm. **15**, 113 (2008).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9851	0.0149

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical stirrer, constant-temperature bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in glass bottles, mechanically stirred for 1 h, and then saturated in a constant-temperature bath for 72 h at 313.15 K. The samples were allowed to equilibrate in a constant temperature at 298.15 K for an additional 24 h to allow the precipitation of the excess dissolved drug. An aliquot of the saturated solution was then removed, filtered, and diluted quantitatively with alcohol for spectroscopic analysis. The reported value represents the average of at least three experimental determinations. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethanol; C_2H_6O; [64-17-5]	[168]F.-Y. Yan, L. Chen, D.-Q. Liu, L.-F. SiMa, M.-J. Chen, H. Shi, and J.-X. Zhu, J. Chem. Eng. Data **54**, 1117 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.15	0.9951	0.004872
283.70	0.9939	0.006067
288.15	0.9924	0.007569
293.10	0.9908	0.009228
298.50	0.9882	0.011780
303.25	0.9857	0.014300
308.65	0.9828	0.017190
313.40	0.9788	0.021190
318.80	0.9754	0.024610
320.15	0.9721	0.027930

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Purity grade, Zhejian Chejiu Pharmaceutical Plant, China, dried *in vacuo* at 323 K for 24 h and stored in a desiccator before use.
(2) 99.8+%, Analytical Reagent grade, Tianjin Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±0.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethanol; C_2H_6O; [64-17-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9799	0.02011

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9878	0.0122

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Propanol; C_3H_8O; [71-23-8]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9870	0.01302

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9867	0.01334

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2-Propanol; C_3H_8O; [67-63-0]	[168]F.-Y. Yan, L. Chen, D.-Q. Liu, L.-F. SiMa, M.-J. Chen, H. Shi, and J.-X. Zhu, J. Chem. Eng. Data **54**, 1117 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.15	0.9948	0.005232
283.60	0.9934	0.006644
288.35	0.9920	0.008030
293.75	0.9902	0.009750
298.50	0.9882	0.011810
303.25	0.9857	0.014270
308.65	0.9823	0.017690
313.40	0.9788	0.021180
318.80	0.9741	0.025920
320.15	0.9728	0.027240

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system.
Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Purity grade, Zhejian Chejiu Pharmaceutical Plant, China, dried *in vacuo* at 323 K for 24 h and stored in a desiccator before use.
(2) 99.8+%, Analytical Reagent grade, Tianjin Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±0.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[164]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9861	0.0139

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9858	0.01416

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99.8+%, HPLC grade, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2-Butanol; $C_4H_{10}O$; [78-92-2]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9858	0.01418

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2-Methyl-1-propanol; $C_4H_{10}O$; [78-83-1]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9914	0.00864

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9853	0.0147

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9844	0.01561

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9683	0.03174

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 2-Pentanol; $C_5H_{12}O$; [6032-29-7]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9850	0.01504

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, Acros Organics, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 3-Methyl-1-butanol; $C_5H_{12}O$; [123-51-3]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9880	0.01204

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9834	0.0166

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Aldrich Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Hexanol; $C_6H_{14}O$; [111-27-3]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9834	0.01663

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, Alfa Aesar, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9799	0.0201

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Heptanol; $C_7H_{16}O$; [111-70-6]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9809	0.01909

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, Alfa Aesar, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[163]G. L. Perlovich, S. V. Kurkov, A. N. Kinchin, and A. Bauer-Brandl, Eur. J. Pharm. Biopharm. **57**, 411 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9854	0.0146

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Very few experimental details were provided. Excess solute and solvent were allowed to equilibrate at constant temperature. Solubility of the dissolved solute was determined by spectrophotometric measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Sigma Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9840	0.01604

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, anhydrous, Aldrich Chemical Company, Milwaukee, Wisconsin, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[167]C. P. Mora and F. Martínez, Fluid Phase Equilib. **255**, 70 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9866	0.01342
298.15	0.9826	0.01742
303.15	0.9798	0.02024
308.15	0.9750	0.02499
313.15	0.9705	0.02949

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a constant-temperature water bath for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9834	0.01664

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[60]A. Fini, M. Laus, I. Orienti, and V. Zecchi, J. Pharm. Sci. **75**, 23 (1986).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
278.2	0.061
298.2	0.116
310.2	0.157

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with stirring at constant temperature. An aliquot of the saturated solution was removed, filtered through a 0.22 μm pore membrane, and diluted quantitatively for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, was recrystallized from suitable solvent before use.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1-Decanol; $C_{10}H_{22}O$; [112-30-1]	[165]C. R. Daniels, A. K. Charlton, R. W. Wold, E. Pustejovsky, A. N. Furman, A. C. Bilbrey, J. N. Love, J. A. Garza, W. E. Acree, Jr., and M. H. Abraham, Phys. Chem. Liq. **42**, 481 (2004).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9837	0.01630

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, calorimetric thermometer, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in amber glass bottles and allowed to equilibrate for several days at constant temperature. Attainment of equilibrium was verified by several repetitive measurements and by approaching equilibrium from supersaturation. Aliquots of saturated solutions were transferred through a coarse filter into tared volumetric flasks, weighed, and diluted with methanol. Concentrations were determined by spectrophotometric measurements at 320 nm.

Source and Purity of Chemicals:
(1) 99%, TCI America, Portland, Oregon, USA, was used as received.
(2) 99+%, Alfa Aesar, USA, stored over molecular sieves and distilled shortly before use.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) (Z)-Octadec-9-en-1-ol (Oleyl alcohol); $C_{18}H_{36}O$; [143-28-2]	[170]M. D. C. Claramonte, A. P. Vialard, and F. G. Vilchez, Int. J. Pharm. **94**, 23 (1993).
Variables:	**Prepared by:**
T/K = 298 K	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9797	0.0203

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]The data were reported in the paper in graphical format, and the mole fraction solubility was interpolated from an enlarged copy of the figure given in the manuscript.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer.
The equilibration method was similar to that described elsewhere [M. D. Contreras, A. Parera, and F. Girela, An. Real Acad. Farm. **58**, 563 (1992)], except that the solute was added to the solvent at 308 K until a precipitate appeared. The samples were then sealed and mechanically shaken at 298 K. After equilibrium was obtained, a weighed aliquot of the saturated solution was removed and diluted with ethanol for spectroscopic analysis at either 271 or 316 nm.

Source and Purity of Chemicals:
(1) Purity not given, Elmu S.A., used as received.
(2) Purity not given, Henkel, used as received.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9962	0.003849

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, centrifuged, filtered through 0.2 μm pore size membranes, and then diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9923	0.007670

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, centrifuged, filtered through 0.2 μm pore size membranes, and then diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[111]Y. J. Manrique, D. P. Pacheco, and F. Martínez, J. Solution Chem. **37**, 165 (2008).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9939	0.00614
298.15	0.9927	0.00726
303.15	0.9914	0.00861
308.15	0.9894	0.01060
313.15	0.9875	0.01250

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate at 313.15 K in a constant-temperature water bath for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The temperature of the water bath was then reduced by 5 K, and the samples re-equilibrated at 308.15 K for an additional two days to allow precipitation of the excess drug. The amount of dissolved drug at the lower temperature was determined by spectroscopic analysis as described above. The procedure was repeated until 293.15 K was reached. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, USP, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9994	0.000558

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, centrifuged, filtered through 0.2 μm pore size membranes, and then diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.8. Naproxen solubility data in ketones

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Propanone; C_3H_6O; [67-64-1]	[166]D. M. Aragón, J. E. Rosas, and F. Martínez, Phys. Chem. Liq. **48**, 437 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9559	0.0441
298.15	0.9496	0.0504
303.15	0.9435	0.0565
308.15	0.9356	0.0644
313.15	0.9271	0.0729

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Propanone; C_3H_6O; [67-64-1]	[168]F.-Y. Yan, L. Chen, D.-Q. Liu, L.-F. SiMa, M.-J. Chen, H. Shi, and J.-X. Zhu, J. Chem. Eng. Data **54**, 1117 (2009).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.25	0.9991	0.000946
283.60	0.9986	0.001374
288.30	0.9983	0.001645
293.05	0.9978	0.002162
298.45	0.9972	0.002811
303.20	0.9964	0.003617
308.70	0.9954	0.004590
313.45	0.9941	0.005919
318.10	0.9928	0.007206
320.15	0.9916	0.008403

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Equilibrium jacketed glass vessel, thermostated circulating water bath, electromagnetic stirrer, analytical balance, laser monitoring system. Experimental solubilities were determined by a synthetic method. Preweighed amounts of solute and solvent and were placed in an equilibrium vessel, which was connected to a circulating constant-temperature water bath. The solution was stirred and small amounts of solute were incrementally added until no further solid dissolved. The dissolution of the solid was determined using laser monitoring. The total amount of solute dissolved was recorded. Experimental measurement was repeated three times.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Purity grade, Zhejian Chejiu Pharmaceutical Plant, China, dried *in vacuo* at 323 K for 24 h and stored in a desiccator before use.
(2) 99.8+%, Analytical Reagent grade, Tianjin Chemical Reagent Company, China, no purification information was given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±0.5% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Propanone; C_3H_6O; [67-64-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9308	0.06922

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Acetophenone; C_8H_8O; [98-86-2]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7047	0.2953

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

21.9. Naproxen solubility data in miscellaneous organic solvents

Components:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1]
(2) Ethanenitrile; C_2H_3N; [75-05-8]

Original Measurements:
[166]D. M. Aragón, J. E. Rosas, and F. Martínez, Phys. Chem. Liq. **48**, 437 (2010).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9951	0.00491
298.15	0.9936	0.00642
303.15	0.9917	0.00829
308.15	0.9895	0.01051
313.15	0.9871	0.01286

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker and an analytical balance.
Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker at 313.15 K for at least three days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by weighing an aliquot of the saturated filtered solution, and then allowing the solvent to evaporate. The mole fraction solubility was calculated from the mass of the solid residue and the mass of the sample taken for analysis. Once the solubility was determined at 313.15 K, the temperature was decreased by 5 K and stabilized at 308.15 K for two days to allow the excess dissolved drug to precipitate at this lower temperature. An aliquot of the new saturated solution was removed, filtered, and the solvent evaporated as before. The procedure was repeated by decreasing the temperature in 5 K increments to reach 293.15 K. The reported mole fraction solubilities represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were provided in the paper.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±1.0% (relative error).

Components:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1]
(2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]

Original Measurements:
[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9847	0.01530

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1]
(2) Propanoic acid; $C_3H_6O_2$; [79-09-4]

Original Measurements:
[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9713	0.02871

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Formamide; CH_3NO; [75-12-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9935	0.006540

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8617	0.1383

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 233 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000342$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, PharmActiv, Feldkirchen-Westerham, Germany, no purification details were provided.
(2) Purity not given, Bayer Leverkusen and Rhone Poulenc Rorer, Cologne, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Castor oil	[92]D. B. Larsen, H. Parshad, K. Fredholt, and C. Larsen, Int. J. Pharm. **232**, 107 (2002).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.125$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a screw-capped test tube and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, centrifuged at 15 000 rpm for 10 min, and diluted quantitatively with ethanol for spectroscopic analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K.
c_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.718$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

21.10. Naproxen solubility data in binary organic solvent mixtures

Components:	Original Measurements:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Naproxen); $C_{14}H_{14}O_3$; [22204-53-1] (2) Ethanol; C_2H_6O; [64-17-5] (3) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[117]D. P. Pacheco, Y. J. Manrique, and F. Martinez, Fluid Phase Equilib. **262**, 23 (2007).
Variables:	**Prepared by:**
Temperature; Solvent composition	W. E. Acree, Jr.

Experimental Values

T/K	$w_2^{(s)}$ [a]	x_1 [b]
293.15	0.00	0.00614
293.15	0.20	0.00848
293.15	0.40	0.0104
293.15	0.60	0.0117
293.15	0.80	0.0125
293.15	1.00	0.0124
298.15	0.00	0.00726
298.15	0.20	0.00986
298.15	0.40	0.0126
298.15	0.60	0.0141
298.15	0.80	0.0149
298.15	1.00	0.0149
303.15	0.00	0.00861
303.15	0.20	0.0125
303.15	0.40	0.0159
303.15	0.60	0.0179
303.15	0.80	0.0199
303.15	1.00	0.0198
308.15	0.00	0.0106
308.15	0.20	0.0149
308.15	0.40	0.0187
308.15	0.60	0.0207
308.15	0.80	0.0221
308.15	1.00	0.0232
313.15	0.00	0.0125
313.15	0.20	0.0179
313.15	0.40	0.0231
313.15	0.60	0.0271
313.15	0.80	0.0293
313.15	1.00	0.0284

[a] $w_2^{(s)}$: initial mass fraction of component 2 in the binary solvent mixture.
[b] x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in stoppered glass flasks and allowed to equilibrate at 313.15 K in a constant-temperature water bath for at least five days. Once equilibrium had been attained, an aliquot of the saturated solution was removed and filtered in order to remove insoluble particles. The concentration of the dissolved drug was determined by spectrophotometric analysis. The temperature of the water bath was then reduced by 5 K, and the samples re-equilibrated at 308.15 K for an additional two days to allow precipitation of the excess drug. The amount of dissolved drug at the lower temperature was determined by spectroscopic analysis as described above. The procedure was repeated until 293.15 K was reached. The densities of the saturated solutions were measured in order to convert the measured concentrations in mol dm^{-3} to mole fraction solubilities. The reported mole fraction solubilities represent the average of three experimental measurements. The densities of the saturated solutions were measured in order to convert the measured molar solubilities (in units of mol dm^{-3}) to mole fraction solubilities

Source and Purity of Chemicals:
(1) Purity not given, USP, no purification details were given in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.
(3) Purity not given, USP, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
$w_2^{(s)}$: ±0.01.
x_1: ±3% (relative error).

22. Solubility of Niflumic Acid in Organic Solvents

22.1. Critical evaluation of experimental solubility data

Niflumic acid (more formally named 2-[[3-(trifluoromethyl)phenyl]amino]-3-pyridinecarboxylic acid) is an analgesic and NSAID used in the treatment of rheumatoid arthritis and arthrosis. There have been several published studies[86,87,89,171–174] involving the solubility of niflumic acid in organic solvents. Most notably, Bustamante *et al.*[171] measured the mole fraction solubility of niflumic acid in 22 different organic solvents, including two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one alkyl alkanoate (ethyl ethanoate), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Pinvidic *et al.*[172] determined the molar solubility of niflumic acid in trichloromethane, methanol, and ethanol at 298 K. The solubility is sufficiently small in these three solvents that one should be able to reasonably convert the observed mole fractions to molarities simply by dividing by the molar volume of the solvent.

TABLE 14. Parameters of the Modified Apelblat equation for describing the solubility of niflumic acid in organic solvents

Solvent	T/K	A	B	C	MARD (%)
Hexane[a]	293–315	−71.358	114.277	10.526	1.1
Ethyl ethanoate[b]	289–308	−20.496	115.461	2.884	0.4
Ethanol[b]	283–308	−58.915	114.603	9.549	1.7
Ethanol[c]	289–321	−56.561	114.652	9.081	7.9
1-Octanol[a]	293–315	−52.996	113.928	8.616	0.5
1-Octanol[c]	282–356	−51.768	114.762	8.340	3.8

[a]Data set of both Surov *et al.*[169] and Perlovich *et al.*[87]
[b]Data set of Bustamante *et al.*[173]
[c]Data set of Domańska *et al.*[89]

Performing this conversion, one finds that the molar solubilities determined by Bustamante *et al.*[171] of $c_1 = 0.01580$, $c_1 = 0.1854$, and $c_1 = 0.1286$ for chloroform, methanol, and ethanol differ significantly from the respective values of $c_1 = 0.00539$, $c_1 = 0.2055$, and $c_1 = 0.1063$ determined by Pinvidic *et al.*[172] It is also noted that Bustamante *et al.*[173] later determined the solubility of niflumic acid in ethanol at several temperatures, and their later value of $x_1 = 0.0163$ at 298 K differs from their earlier value of $x_1 = 0.01442$ by slightly more than 10 relative percent. Large deviations are also noted in two sets of solubility data determined by Bustamante *et al.* for niflumic acid dissolved in ethyl ethanoate, $x_1 = 0.0000910$ (Ref. 171) versus $x_1 = 0.0254$ (Ref. 173). Currently there are no polymorphic modifications known for niflumic acid[175] that would explain the large deviations between the independent sets of experimental solubility measurements.

There have been four experimental studies[86,87,89,173] reporting how the solubility of niflumic acid varied with temperature. Surov *et al.*[86] and Perlovich *et al.*[87] both examined the solubility of niflumic acid in hexane and 1-octanol. Domańska *et al.*[89] measured niflumic acid solubilities in ethanol and 1-octanol using a dynamic method that recorded the temperature at which the last crystals of the solid solute disappeared. Bustamante *et al.*[173] reported niflumic acid solubilities in ethyl ethanoate and ethanol in the temperature range between 283 and 308 K. The internal consistency of the six datasets was assessed by curve-fitting the measured mole-fraction solubility data to Eq. (8). The values of the equation coefficients (A, B, and C) are given in Table 14, along with the mean absolute relative deviation.

The experimental solubility data for niflumic acid in organic solvents are given in Secs. 22.2–22.10.

22.2. Niflumic acid solubility data in saturated hydrocarbons (including cycloalkanes)

Components:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]
(2) Hexane; C_6H_{14}; [110-54-3]

Original Measurements:
[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009).
[87]G. L. Perlovich, A. O. Surov, and A. Bauer-Brandl, J. Pharm. Biomed. Anal. **45**, 679 (2007).

Variables:	Prepared by:
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9999	0.0000140
298.2	0.9999	0.0000165
303.2	0.9999	0.0000203
310.2	0.9999	0.0000247
315.2	0.9999	0.0000291

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Heptane; C_7H_{16}; [142-82-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9928	0.00718

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000162

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.3. Niflumic acid solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Benzene; C_6H_6; [71-43-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9995	0.000470

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.4. Niflumic acid solubility data in esters

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000910

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[173]P. Bustamante, J. Navarro, S. Romero, and B. Escalera, J. Pharm. Sci. **91**, 874 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.2	0.9778	0.0222
288.2	0.9769	0.0231
293.2	0.9756	0.0244
298.2	0.9746	0.0254
303.2	0.9736	0.0264
308.2	0.9723	0.0273

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed flasks and allowed to equilibrate at constant temperature with shaking in a temperature-controlled bath for four days. An aliquot of the saturated solution was removed, filtered through a 0.2 μm pore size membrane filter, and diluted quantitatively with 96% (by volume) ethanol. The molar solubility of the drug was determined by spectrophotometric analysis at 290 nm. The solubility determinations were repeated three times. The densities of the saturated solutions were determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided in the paper.
(2) Purity not given, Spectrophotometric grade, Panreac, Monplet and Esteban, Barcelona, Spain, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

22.5. Niflumic acid solubility data in ethers

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9722	0.02785

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9517	0.04832

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.6. Niflumic acid solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) Trichloromethane; $CHCl_3$; [67-66-3]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9987	0.00128

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[172]J. J. Pinvidic, A. Gonthier-Vassal, H. Szwarc, R. Ceolin, P. Toffoli, J. M. Teulon, and C. Guechot, Thermochim. Acta **153**, 37 (1989).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00532$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Very few details were reported in the paper. Solvent was slowly added in increments of 0.10 cm^3 to a known quantity of solid solute. The solution was observed under transverse light against a dark background. The final concentration at which the solid traces was still visible and the first concentration at which trace solid was not visible were recorded. Solubility was calculated as the mean of the two recorded concentrations.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
c_1: ±3.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9817	0.01832

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9950	0.00502

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.7. Niflumic acid solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9924	0.00755

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[172]J. J. Pinvidic, A. Gonthier-Vassal, H. Szwarc, R. Ceolin, P. Toffoli, J. M. Teulon, and C. Guechot, Thermochim. Acta **153**, 37 (1989).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.2055$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Very few details were reported in the paper. Solvent was slowly added in increments of 0.10 cm^3 to a known quantity of solid solute. The solution was observed under transverse light against a dark background. The final concentration at which the solid traces was still visible and the first concentration at which trace solid was not visible were recorded. Solubility was calculated as the mean of the two recorded concentrations.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
c_1: ±4.0% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[172]J. J. Pinvidic, A. Gonthier-Vassal, H. Szwarc, R. Ceolin, P. Toffoli, J. M. Teulon, and C. Guechot, Thermochim. Acta **153**, 37 (1989).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1063$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Very few details were reported in the paper. Solvent was slowly added in increments of 0.10 cm^3 to a known quantity of solid solute. The solution was observed under transverse light against a dark background. The final concentration at which the solid traces was still visible and the first concentration at which trace solid was not visible were recorded. Solubility was calculated as the mean of the two recorded concentrations.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided in the paper.
(2) Purity not given, chemical source not specified, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
c_1: ±7.0% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Ethanol; C_2H_6O; [64-17-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9855	0.01449

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Ethanol; C_2H_6O; [64-17-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
289.4	0.9896	0.0104
299.0	0.9889	0.0111
304.6	0.9872	0.0128
310.3	0.9838	0.0162
316.7	0.9799	0.0201
320.8	0.9751	0.0249

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Ethanol; C_2H_6O; [64-17-5]	[173]P. Bustamante, J. Navarro, S. Romero, and B. Escalera, J. Pharm. Sci. **91**, 874 (2002).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
283.2	0.9897	0.0103
288.2	0.9881	0.0119
293.2	0.9865	0.0135
298.2	0.9837	0.0163
303.2	0.9815	0.0185
308.2	0.9775	0.0225

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed flasks and allowed to equilibrate at constant temperature with shaking in a temperature-controlled bath for four days. An aliquot of the saturated solution was removed, filtered through a 0.2 μm pore size membrane filter, and diluted quantitatively with 96% (by volume) ethanol. The molar solubility of the drug was determined by spectrophotometric analysis at 290 nm. The solubility determinations were repeated three times. The densities of the saturated solutions were determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided in the paper.
(2) Purity not given, Spectrophotometric grade, Panreac, Monplet and Esteban, Barcelona, Spain, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9816	0.01841

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000457

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
282.3	0.9851	0.0149
299.3	0.9798	0.0202
305.2	0.9759	0.0241
313.3	0.9694	0.0306
321.6	0.9623	0.0377
329.3	0.9550	0.0450
335.3	0.9441	0.0559
346.5	0.9295	0.0705
355.8	0.9121	0.0879

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009). [87]G. L. Perlovich, A. O. Surov, and A. Bauer-Brandl, J. Pharm. Biomed. Anal. **45**, 679 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.2	0.9741	0.0259
298.2	0.9706	0.0294
303.2	0.9664	0.0336
310.2	0.9591	0.0409
315.2	0.9532	0.0468

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Sigma Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9989	0.00106

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9994	0.000625

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9993	0.000652

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.8. Niflumic acid solubility data in ketones

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Propanone; C_3H_6O; [67-64-1]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9990	0.000970

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7] (2) Acetophenone; C_8H_8O; [98-86-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9992	0.000751

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent was evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.9. Niflumic acid solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) Formamide; CH_3NO; [75-12-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9973	0.00274

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent was evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.5328	0.4672

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
(2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9921	0.00788

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]
(2) Propanoic acid; $C_3H_6O_2$; [79-09-4]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9793	0.02071

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 289 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

22.10. Niflumic acid solubility data in binary organic solvent mixtures

Components:
(1) 2-[[3-(Trifluoromethyl)phenyl]-amino]-3-pyridinecarboxylic acid (Niflumic acid); $C_{13}H_9F_3N_2O_2$; [4394-00-7]
(2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]
(3) Ethanol; C_2H_6O; [64-17-5]

Original Measurements:
[173]P. Bustamante, J. Navarro, S. Romero, and B. Escalera, J. Pharm. Sci. **91**, 874 (2002).

Variables:
Temperature; Solvent composition

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	$v_2^{(s)}$[a]	x_1[b]
283.2	0.00	0.0103
283.2	0.10	0.0149
283.2	0.30	0.0237
283.2	0.50	0.0370
283.2	0.60	0.0429
283.2	0.70	0.0472
283.2	0.80	0.0507
283.2	0.90	0.0344
283.2	1.00	0.0322
288.2	0.00	0.0119
288.2	0.10	0.0179
288.2	0.30	0.0273
288.2	0.50	0.0400
288.2	0.60	0.0460
288.2	0.70	0.0500
288.2	0.80	0.0513
288.2	0.90	0.0355
288.2	1.00	0.0231
293.2	0.00	0.0135
293.2	0.10	0.0206
293.2	0.30	0.0312
293.2	0.50	0.0428
293.2	0.60	0.0504
293.2	0.70	0.0527
293.2	0.80	0.0519
293.2	0.90	0.0365
293.2	1.00	0.0244
298.2	0.00	0.0163
298.2	0.10	0.0240
298.2	0.30	0.0352
298.2	0.50	0.0482
298.2	0.60	0.0542
298.2	0.70	0.0550
298.2	0.80	0.0524
298.2	0.90	0.0374
298.2	1.00	0.0254
303.2	0.00	0.0185
303.2	0.10	0.0266
303.2	0.30	0.0400
303.2	0.50	0.0510
303.2	0.60	0.0570
303.2	0.70	0.0580
303.2	0.80	0.0528
303.2	0.90	0.0386
303.2	1.00	0.0264

T/K	$v_2^{(s)}$ [a]	x_1 [b]
308.2	0.00	0.0225
308.2	0.10	0.0310
308.2	0.30	0.0456
308.2	0.50	0.0558
308.2	0.60	0.0607
308.2	0.70	0.0608
308.2	0.80	0.0533
308.2	0.90	0.0397
308.2	1.00	0.0273

[a] $v_2^{(s)}$: initial volume fraction of component 2 in the binary solvent mixture.
[b] x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Temperature-controlled bath, analytical balance, and an UV/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed flasks and allowed to equilibrate at constant temperature with shaking in a temperature-controlled bath for four days. An aliquot of the saturated solution was removed, filtered through a 0.2 μm pore size membrane filter, and diluted quantitatively with 96% (by volume) ethanol. The molar solubility of the drug was determined by spectrophotometric analysis at 290 nm. The solubility determinations were repeated three times. The densities of the saturated solutions were determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fraction.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided in the paper.
(2) Purity not given, Spectrophotometric grade, Panreac, Monplet and Esteban, Barcelona, Spain, no purification details were given in the paper.
(3) Purity not given, Spectrophotometric grade, Panreac, Monplet and Esteban, Barcelona, Spain, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
$v_2^{(s)}$: ±0.01.
x_1: ±3% (relative error).

23. Solubility of Nimesulide in Organic Solvents

23.1. Critical evaluation of experimental solubility data

Nimesulide (more formally named 2-phenoxy-4-nitromethanesulfonanilide) is a selective COX-2 inhibitor, and was once among the most prescribed NSAIDs for the treatment of osteoarthritis, muscular pain, chronic inflammation, and other painful conditions. Concerns regarding harmful liver-associated side effects have resulted in the withdrawal of the drug from the market in several countries, while in other countries the drug was never marketed or restrictions have been imposed on its use.[175–178] There has been only a single publication reporting the solubility of nimesulide in organic solvents. Seedher and Bhatia[67] determined the molar solubility of nimesulide in methanol, ethanol, 1-butanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, 1,2,3-propanetriol, and polyethylene glycol 400 (PEG 400) at 298 K. Nimesulide solubilities were also measured in binary ethanol + 1,2,3-propanetriol and ethanol + PEG 400 solvent mixtures. It is not possible to perform a critical evaluation of the experimental data as there are no independent experimental solubility data for nimesulide in these eight organic solvents.

The experimental solubility data for nimesulide in organic solvents are given in Secs. 23.2–23.4.

23.2. Nimesulide solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0286$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0108$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00688$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00315$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00165$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00571$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000707$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

23.3. Nimesulide solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.2047$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

23.4. Nimesulide solubility data in binary organic solvent mixtures

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) Ethanol; C_2H_6O; [64-17-5] (3) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.2008
0.10	0.2087
0.20	0.1798
0.40	0.1145
0.60	0.0784
0.80	0.0315
1.00	0.0106

[a]$v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Phenoxy-4-nitromethanesulfonanilide (Nimesulide); $C_{13}H_{12}N_2O_5S$; [51803-78-2] (2) Ethanol; C_2H_6O; [64-17-5] (3) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.000693
0.10	0.001323
0.20	0.002198
0.40	0.005386
0.60	0.008744
0.80	0.01088
0.90	0.01285
1.00	0.01056

[a]$v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with 20% aqueous acetonitrile for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 302 nm.

Source and Purity of Chemicals:
(1) Purity not given, Panacea Biotec Ltd., Lalru, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

24. Solubility of Phenylbutazone in Organic Solvents

24.1. Critical evaluation of experimental solubility data

Phenylbutazone (more formally named 4-butyl-1,2-diphenyl-pyrazolidine-3,5-dione) is a NSAID and potent pain reliever used for the relief of lameness, soft-tissue injury, muscle

TABLE 15. Parameters of the Modified Apelblat equation for describing the solubility of phenylbutazone in ethanol and 1-octanol

Solvent	T/K	A	B	C	MARD (%)
Ethanol[a]	278–345	14.798	−5623.65	−0.118	20.0
1-Octanol[a]	278–345	−33.709	−5624.73	8.246	14.7

[a]Experimental data determined by Domańska *et al.*[180]

soreness, laminitis, and bone and joint problems in horses. There have been three published studies[65,179,180] involving the solubility of phenylbutazone in organic solvents. Datta and Grant[179] determined the molar solubility of phenylbutazone in 1,1′-oxybisethane, methanol, and propanone at 305 K in their investigation of the relative nucleation rate of phenylbutazone and ulfamerazine in organic solvents. The solvent's physical and chemical properties affect the crystallization rate, and play an important role in determining particle size and morphology of the crystallized material. Rytting *et al.*[65] reported the solubility of phenylbutazone in polyethylene glycol 400 (PEG 400) at ambient room temperature.

Domańska *et al.*[180] measured the solubility of phenylbutazone in ethanol and 1-octanol as a function of temperature using a dynamic method that recorded the temperature at which the last crystal disappeared. The internal consistency of the dataset was assessed by curve-fitting the measured mole fraction solubility data to Eq. (8). The values of the equation coefficients (*A*, *B*, and *C*) are given in Table 15, along with the mean absolute relative deviation. Readers are reminded that, in assessing the derived mathematical correlations, one must take into account the size of the range of mole fraction solubilities covered in each dataset. It is very easy to describe solubility data that vary little with temperature. In the case of 1-octanol, the experimental phenylbutazone solubilities cover more than a 180-fold range in mole fraction, from approximately $x_1^{sat} = 0.0019$ at 295.0 K to $x_1^{sat} = 0.3560$ at 355.7 K. The measured phenylbutazone solubilities at both 286.6 and 290.7 K were excluded from the regression analysis in order to lower the MARD to a reasonable value.

The experimental solubility data for phenylbutazone in organic solvents are given in Secs. 24.2–24.5.

24.2. Phenylbutazone solubility data in ethers

Components:
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]
(2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]

Original Measurements:
[179]S. Datta and D. J. W. Grant, Cryst. Growth Des. **5**, 1351 (2005).

Variables:
T/K = 305.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000259$ mol dm^{-3}. The density of the saturated solution was 0.703 g cm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and allowed to equilibrate at a constant temperature with shaking for 72 h. Aliquots of saturated solutions were removed, and diluted quantitatively for spectroscopic analysis at 243 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) 99.9%, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Fisher Scientific Chemicals, Fairlawn, New Jersey, USA, was stored over molecular sieves before use.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

24.3. Phenylbutazone solubility data in alcohols

Components:
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]
(2) Methanol; CH_4O; [67-56-1]

Original Measurements:
[179]S. Datta and D. J. W. Grant, Cryst. Growth Des. **5**, 1351 (2005).

Variables:
T/K = 305.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000174$ mol dm^{-3}. The density of the saturated solution was 0.844 g cm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and allowed to equilibrate at a constant temperature with shaking for 72 h. Aliquots of saturated solutions were removed, and diluted quantitatively for spectroscopic analysis at 243 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) 99.9%, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Fisher Scientific Chemicals, Fairlawn, New Jersey, USA, was stored over molecular sieves before use.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

Components:	Original Measurements:
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]	[180]U. Domańska, A. Pobudkowska, A. Pelczarska, and L. Zukowski, Int. J. Pharm. **403**, 115 (2011).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
277.5	0.9972	0.0028
279.2	0.9967	0.0033
283.3	0.9961	0.0039
286.7	0.9955	0.0045
291.5	0.9946	0.0054
297.0	0.9938	0.0062
303.1	0.9914	0.0086
306.7	0.9897	0.0103
312.0	0.9840	0.0160
316.9	0.9788	0.0212
320.7	0.9716	0.0284
325.9	0.9603	0.0397
330.0	0.9467	0.0533
333.0	0.9319	0.0681
336.3	0.9041	0.0959
339.7	0.8520	0.1480
345.2	0.7750	0.2250

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]	[180]U. Domańska, A. Pobudkowska, A. Pelczarska, and L. Zukowski, Int. J. Pharm. **403**, 115 (2011).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
286.6	0.9998	0.0002
290.7	0.9990	0.0010
295.0	0.9981	0.0019
300.5	0.9950	0.0050
306.7	0.9911	0.0089
310.8	0.9851	0.0149
317.3	0.9767	0.0233
320.7	0.9715	0.0285
325.0	0.9626	0.0374
330.0	0.9511	0.0489
335.0	0.9390	0.0610
337.3	0.9290	0.0710
341.4	0.8790	0.1210
346.7	0.8090	0.1910
351.1	0.7350	0.2650
355.7	0.6440	0.3560

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

24.4. Phenylbutazone solubility data in ketones

Components:	Original Measurements:
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]	[179]S. Datta and D. J. W. Grant, Cryst. Growth Des. **5**, 1351 (2005).
(2) Propanone; C_3H_6O; [67-64-1]	
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00111$ mol dm^{-3}. The density of the saturated solution was 0.900 g cm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and allowed to equilibrate at a constant temperature with shaking for 72 h. Aliquots of saturated solutions were removed, and diluted quantitatively for spectroscopic analysis at 243 nm. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) 99.9%, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Fisher Scientific Chemicals, Fairlawn, New Jersey, USA, was stored over molecular sieves before use.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±3% (relative error).

24.5. Phenylbutazone solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 4-Butyl-1,2-diphenyl-pyrazolidine-3,5-dione (Phenylbutazone); $C_{19}H_{20}N_2O_2$; [50-33-9]	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.192$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

25. Solubility of Piroxicam in Organic Solvents

25.1. Critical evaluation of experimental solubility data

Piroxicam (more formally named 4-hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide) is a NSAID used to relieve symptoms of osteoarthritis and rheumatoid arthritis in humans. It has also been used in veterinary medicine to treat canines with transitional cell carcinoma of the urinary bladder.[181,182] There have been several publications[64,171,183–185] involving the solubility of piroxicam in organic solvents. Most notably, Bustamante *et al.*[171] measured the mole fraction solubility of piroxicam in 22 different organic solvents, including two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one alkyl alkanoate (ethyl ethanoate), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Wyttenbach *et al.*[185] investigated the solubility of piroxicam in ethanol, polyethylene glycol 400, and olive oil at ambient room temperature using a residual solid screening assay method performed in 96-well multiscreen solubility filter plates. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. It is not possible to perform a critical evaluation in regard to these solubility data as ethanol is the only common solvent and the independent sets of measurements were performed at different temperatures (298 K and ambient room temperature).

There is only a single publication reporting the solubility of piroxicam as a function of temperature. Sotomayor *et al.*[184] measured the mole fraction solubility of piroxicam in ethanol as a function of temperature from 293 to 315 K. The internal consistency of the Sotomayor *et al.* dataset was assessed by curve-fitting the measured mole fraction solubility data to the Modified Apelblat model [see Eq. (8)] to yield the following representation:

$$\ln x_1 = -80.938 + \frac{115.356}{T} + 12.652 \ln T. \qquad (33)$$

The mean absolute relative deviation between the observed experimental data and back-calculated values based on Eq. (33) of MARD = 2.7% is comparable in magnitude to the experimental uncertainty associated with the measured values.

The experimental solubility data for piroxicam in organic solvents are in Secs. 25.2–25.9.

25.2. Piroxicam solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Heptane; C_7H_{16}; [142-82-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000135

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000179

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.3. Piroxicam solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Benzene; C_6H_6; [71-43-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000722

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.4. Piroxicam solubility data in esters

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9976	0.00244

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.5. Piroxicam solubility data in ethers

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000505

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) 1,4-Dioxane; $C_4H_4O_2$; [123-91-1]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9951	0.00494

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.6. Piroxicam solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9774	0.0226

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9912	0.00884

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000704

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed, and the solvent was evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.7. Piroxicam solubility data in alcohols

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Methanol; CH_4O; [67-56-1]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000206

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethanol; C_2H_6O; [64-17-5]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.000141

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethanol; C_2H_6O; [64-17-5]	[183]R. G. Sotomayor, A. R. Holguin, D. M. Cristancho, D. R. Delgado, and F. Martínez, J. Mol. Liq. **180**, 34 (2013).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.9998	0.000214

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Recirculating thermostatic bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in stoppered dark glass flasks and allowed to equilibrate in a recirculating thermostatic bath for at least seven days. Aliquots of saturated solutions were removed and filtered to ensure that they were free of particulate matter. The filtrate was diluted with ethanol for spectroscopic analysis. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) 99.5%, Sinobright Pharmaceutical Company, Ltd., no purification details were provided. The authors stated that the sample used was in agreement with the quality requirements of the American Pharmacopeia, USP.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethanol; C_2H_6O; [64-17-5]	[184]R. G. Sotomayor, S. R. Holguín, A. Romdhani, F. Martínez, and A. Jouyban, J. Solution Chem. **42**, 358 (2013).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.15	0.9998	0.000166
298.15	0.9998	0.000214
303.15	0.9997	0.000270
308.15	0.9997	0.000320
313.15	0.9996	0.000373

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostatic mechanical shaker, recirculating thermostatic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in dark stoppered glass flasks and allowed to equilibrate in a thermostatic mechanical shaker (for 303.15, 308.15, and 313.15 K) or recirculating thermostatic bath (for 293.15 and 298.15 K) for at least seven days. An aliquot of the saturated solution was withdrawn and filtered to remove any particulate matter. Samples were diluted quantitatively with alcohol and concentrations determined by spectrophotometric measurements. Experimental determinations were performed in at least triplicate.

Source and Purity of Chemicals:
(1) 99.5+%, Sinobright Pharmaceutical Company, Ltd., purification details were provided in the paper.
(2) Absolute, Analytical Reagent grade, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K (estimated by compiler).
x_1: ±2.0% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethanol; C_2H_6O; [64-17-5]	[185]N. Wyttenbach, J. Alsenz, and O. Grassmann, Pharm. Res. **24**, 888 (2007).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00407$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
96-Well multiscreen solubility filter plates, centrifuge, and a ultraperformance liquid chromatograph.
Solubilities were determined by the solubility and residual solid screening assay method, which was performed in 96-well multiscreen solubility filter plates. The compound was dispersed volumetrically into filter plates using a manual powder dispenser for 96-well plates. Single-use stirring bars and 100 µl of the solvent were then added. Immediately after filling the plate was sealed by a septum sheet using a custom-built clamp device. The resulting solution was mixed by head-over-head rotation at 20 rpm for 24 h at ambient room temperature. The septum sheet was removed, and the liquid was separated from the residual solid by centrifugation for 5 min. The concentration of the dissolved solute was determined by ultraperformance liquid chromatographic analysis. Reported value represents the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemie GmbH, Buchs, Switzerland, no purification details were provided.
(2) Purity not given, HPLC grade, chemical source not specified, used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9998	0.000247

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4]
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9997	0.000300

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4]
(2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.000140

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4]
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9997	0.000271

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4]
(2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000283

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.8. Piroxicam solubility data in ketones

Components:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4]
(2) Propanone; C_3H_6O; [67-64-1]

Original Measurements:
[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9972	0.00281

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Acetophenone; C_8H_8O; [98-86-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9998	0.000204

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed, and the solvent was evaporated. The residual solid was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

25.9. Piroxicam solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Formamide; CH_3NO; [75-12-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9995	0.000499

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [68-12-2]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9832	0.01676

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9991	0.000881

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	[171]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **174**, 141 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9984	0.00160

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 256 nm. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, UPSA, Agen, France, no purification details were provided. Water content of the sample was determined to be 5.8% based on Karl Fisher analysis.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Polyethylene glycol 400 (PEG 400)	[185]N. Wyttenbach, J. Alsenz, and O. Grassmann, Pharm. Res. **24**, 888 (2007).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0606$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
96-Well multiscreen solubility filter plates, centrifuge, and a ultra-performance liquid chromatograph.
Solubilities were determined by the solubility and residual solid screening assay method, which was performed in 96-well multiscreen solubility filter plates. The compound was dispersed volumetrically into filter plates using a manual powder dispenser for 96-well plates. Single-use stirring bars and 100 µl of the solvent were then added. Immediately after filling the plate was sealed by a septum sheet using a custom-built clamp device. The resulting solution was mixed by head-over-head rotation at 20 rpm for 24 h at ambient room temperature. The septum sheet was removed, and the liquid was separated from the residual solid by centrifugation for 5 min. The concentration of the dissolved solute was determined by ultraperformance liquid chromatographic analysis. Reported value represents the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemie GmbH, Buchs, Switzerland, no purification details were provided.
(2) Purity not given, chemical source not specified, used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Olive oil	[185]N. Wyttenbach, J. Alsenz, and O. Grassmann, Pharm. Res. **24**, 888 (2007).
Variables:	**Prepared by:**
T/K = ambient room temperature	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00220$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
96-Well multiscreen solubility filter plates, centrifuge, and a ultraperformance liquid chromatograph.
Solubilities were determined by the solubility and residual solid screening assay method, which was performed in 96-well multiscreen solubility filter plates. The compound was dispersed volumetrically into filter plates using a manual powder dispenser for 96-well plates. Single-use stirring bars and 100 μl of the solvent were then added. Immediately after filling the plate was sealed by a septum sheet using a custom-built clamp device. The resulting solution was mixed by head-over-head rotation at 20 rpm for 24 h at ambient room temperature. The septum sheet was removed, and the liquid was separated from the residual solid by centrifugation for 5 min. The concentration of the dissolved solute was determined by ultraperformance liquid chromatographic analysis. Reported value represents the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemie GmbH, Buchs, Switzerland, no purification details were provided.
(2) Purity not given, chemical source not specified, used as received.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-(2-pyridyl)-2*H*-1,2-benzothiazine-3-carboxamide 1,1-dioxide (Piroxicam); $C_{15}H_{13}N_3O_4S$; [36322-90-4] (2) Mineral oil	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000180$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Pfizer, Karlsruhe, Germany, no purification details were provided.
(2) Purity not given, Bayer Leverkusen and Rhone Poulenc Rorer, Cologne, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

26. Solubility of Rofecoxib in Organic Solvents

26.1. Critical evaluation of experimental solubility data

Rofecoxib (more formally named 3-phenyl-4-[4-(methylsulfonyl)phenyl]-2(5*H*)-furanone) is a NSAID that was once used to treat patients having arthritis and other medical conditions causing acute or chronic pain. The drug was withdrawn from the market in 2004 because of concerns regarding increased risk of adverse cardiovascular events (heart attacks and strokes) due to high-dosage and long-term use.[186] There have been several studies[67,187–189] involving the solubility of rofecoxib in organic solvents. Desai and co-workers[187,188] determined the molar solubility of rofecoxib in methanol, ethanol, 1,2-propanediol, and 1,2,3-propanetriol at 298, 303, and 308 K based on spectrophotometric measurements. Seedher and Bhatia[67] published molar solubility data for rofecoxib in six alcohols (methanol, ethanol, 1-butanol, 1-octanol, 1,2-ethanediol, and 1,2-propanediol), and in polyethylene glycol 400 (PEG 400). Rofecoxib solubilities were also measured in binary ethanol + 1,2,3-propanetriol and ethanol + PEG solvent mixtures. There are two common solvents in the independent sets of experimental solubility data. The independent sets of solubility measurements differ by approximately a factor of 1.7: $c_1 = 0.00266$ (Ref. 67) versus $c_1 = 0.00445$ (Ref. 187) for the solubility in methanol at 298 K; and $c_1 = 0.00217$ (Ref. 67) versus $c_1 = 0.00126$ (Ref. 188) versus $c_1 = 0.00124$ (Ref. 187) for the solubility in ethanol at 298 K.

The experimental solubility data for rofecoxib in organic solvents are given in Secs. 26.2–26.4.

26.2. Rofecoxib solubility data in alcohols

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Methanol; CH_4O; [67-56-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00266$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Methanol; CH_4O; [67-56-1]	[187]K. G. H. Desai, A. R. Kulkarni, and T. M. Aminabhavi, J. Chem. Eng. Data. **48**, 942 (2003).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a,b]
298.15	0.00445
303.15	0.00624
308.15	0.00875

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.
[b]Solubilities are reported in the paper as the micrograms of dissolved solute per milliliter of solution. Molar solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a closed cap tube, shaken thoroughly for 6 h at each temperature, and then allowed to stand immersed in a stirred circulation constant-temperature water bath until equilibrium was obtained. An aliquot of the saturated solution was removed and the concentration of the dissolved solute determined spectrophotometrically at 285 nm.

Source and Purity of Chemicals:
(1) 99.4%, Eros Pharma, Bangalore, India, no purification details were given in the paper.
(2) Purity not given, S. D. Fine Chemicals, Mumbai, India, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Ethanol; C_2H_6O; [64-17-5]	[188]C. Liu, K. G. H. Desai, X. Tang, and X. Chen, J. Chem. Eng. Data. **50**, 2061 (2005).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a,b]
298.15	0.00126
303.15	0.00162
308.15	0.00199

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.
[b]solubilities are reported in the paper as the micrograms of dissolved solute per milliliter of solution. Molar solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and a high-performance liquid chromatograph with UV detection.
Excess solute and solvent were placed in a closed cap tube and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter (Millipore, USA), and diluted quantitatively. The molar solubility of the drug was determined by high-performance chromatographic analysis with uv detection at 254 nm. Reported values represent the average of six experimental determinations.

Source and Purity of Chemicals:
(1) 99.2%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemicals Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±1.5% (relative error).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Ethanol; C_2H_6O; [64-17-5]	[187]K. G. H. Desai, A. R. Kulkarni, and T. M. Aminabhavi, J. Chem. Eng. Data. **48**, 942 (2003).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a,b]
298.15	0.00124
303.15	0.00161
308.15	0.00195

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.
[b]Solubilities are reported in the paper as the micrograms of dissolved solute per milliliter of solution. Molar solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a closed cap tube, shaken thoroughly for 6 h at each temperature, and then allowed to stand immersed in a stirred circulation constant-temperature water bath until equilibrium was obtained. An aliquot of the saturated solution was removed and the concentration of the dissolved solute determined spectrophotometrically at 285 nm.

Source and Purity of Chemicals:
(1) 99.4%, Eros Pharma, Bangalore, India, no purification details were given in the paper.
(2) Purity not given, S. D. Fine Chemicals, Mumbai, India, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±2.0% (relative error).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Ethanol; C_2H_6O; [64-17-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00217$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1-Butanol; $C_4H_{10}O$; [71-36-3]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000601$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000372$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000401$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00366$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[188]C. Liu, K. G. H. Desai, X. Tang, and X. Chen, J. Chem. Eng. Data. **50**, 2061 (2005).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a,b]
298.15	0.000544
303.15	0.000607
308.15	0.000721

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.
[b]Solubilities are reported in the paper as the micrograms of dissolved solute per milliliter of solution. Molar solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and a high-performance liquid chromatograph with uv detection.
Excess solute and solvent were placed in a closed cap tube and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter (Millipore, USA), and diluted quantitatively. The molar solubility of the drug was determined by high-performance chromatographic analysis with uv detection at 254 nm. Reported values represent the average of six experimental determinations.

Source and Purity of Chemicals:
(1) 99.2%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) 99%, Showa Chemicals Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±1.5% (relative error).

Components:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7]
(2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]

Original Measurements:
[189]K. M. El-Say, A. M. Samy, and M. I. Fetouh, Int. J. Pharm. Sci. Rev. Res. **3**, 135 (2010).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.0435$ (mass percent).

Auxiliary Information

Method/Apparatus/Procedure:
Ultrasonic bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed test tubes and sonicated for 48 h. The sample was then cooled to 298 K. The solution was then filtered through a 0.45 μm Millipore filter, and a weighted aliquot of the filtered supernatant solution was diluted with methanol for spectrophotometric analysis at 268 nm.

Source and Purity of Chemicals:
(1) Purity not given, Egyptian International Pharmaceutical Industries Company, Egypt, no purification details were provided.
(2) Purity not given, El-Nasr Pharmaceutical Chemicals, Egypt, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

Components:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7]
(2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]

Original Measurements:
[188]C. Liu, K. G. H. Desai, X. Tang, and X. Chen, J. Chem. Eng. Data. **50**, 2061 (2005).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	c_1[a,b]
298.15	0.000225
303.15	0.000303
308.15	0.000376

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.
[b]Solubilities are reported in the paper as the micrograms of dissolved solute per milliliter of solution. Molar solubilities were calculated by the compiler.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath and a high-performance liquid chromatograph with uv detection.
Excess solute and solvent were placed in a closed cap tube and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter (Millipore, USA), and diluted quantitatively. The molar solubility of the drug was determined by high-performance chromatographic analysis with uv detection at 254 nm. Reported values represent the average of six experimental determinations.

Source and Purity of Chemicals:
(1) 99.2%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemicals Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±1.5% (relative error).

Components:
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7]
(2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]

Original Measurements:
[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000344$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[189]K. M. El-Say, A. M. Samy, and M. I. Fetouh, Int. J. Pharm. Sci. Rev. Res. **3**, 135 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.2405$ (mass percent).

Auxiliary Information

Method/Apparatus/Procedure:
Ultrasonic bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed test tubes and sonicated for 48 h. The sample was then cooled to 298 K. The solution was then filtered through a 0.45 μm Millipore filter, and a weighted aliquot of the filtered supernatant solution was diluted with methanol for spectrophotometric analysis at 268 nm.

Source and Purity of Chemicals:
(1) Purity not given, Egyptian International Pharmaceutical Industries Company, Egypt, no purification details were provided.
(2) Purity not given, El-Nasr Pharmaceutical Chemicals, Egypt, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

26.3. Rofecoxib solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0357$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Polyethylene glycol 400 (PEG 400)	[189]K. M. El-Say, A. M. Samy, and M. I. Fetouh, Int. J. Pharm. Sci. Rev. Res. **3**, 135 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $s_1 = 0.9569$ (mass percent).

Auxiliary Information

Method/Apparatus/Procedure:
Ultrasonic bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed test tubes and sonicated for 48 h. The sample was then cooled to 298 K. The solution was then filtered through a 0.45 μm Millipore filter, and a weighted aliquot of the filtered supernatant solution was diluted with methanol for spectrophotometric analysis at 268 nm.

Source and Purity of Chemicals:
(1) Purity not given, Egyptian International Pharmaceutical Industries Company, Egypt, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Polyethylene glycol 600 (PEG 600)	[189]K. M. El-Say, A. M. Samy, and M. I. Fetouh, Int. J. Pharm. Sci. Rev. Res. **3**, 135 (2010).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be s_1 = 1.0382 (mass percent).

Auxiliary Information

Method/Apparatus/Procedure:
Ultrasonic bath and an ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in sealed test tubes and sonicated for 48 h. The sample was then cooled to 298 K. The solution was then filtered through a 0.45 μm Millipore filter, and a weighted aliquot of the filtered supernatant solution was diluted with methanol for spectrophotometric analysis at 268 nm.

Source and Purity of Chemicals:
(1) Purity not given, Egyptian International Pharmaceutical Industries Company, Egypt, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

26.4. Rofecoxib solubility data in binary organic solvent mixtures

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Ethanol; C_2H_6O; [64-17-5] (3) Polyethylene glycol 400 (PEG 400)	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.0357
0.10	0.0285
0.20	0.0259
0.40	0.0126
0.60	0.00709
0.80	0.00320
1.00	0.00217

[a]$v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 3-Phenyl-4-[4-(methylsulfonyl)-phenyl]-2(5*H*)-furanone (Rofecoxib); $C_{17}H_{14}O_4S$; [162011-90-7] (2) Ethanol; C_2H_6O; [64-17-5] (3) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[67]N. Seedher and S. Bhatia, AAPS PharmSciTech **4**, 33/1 (2003).
Variables:	**Prepared by:**
T/K = 298; Solvent composition	W. E. Acree, Jr.

Experimental Values

$v_2^{(s)}$ [a]	c_1 [b]
0.00	0.000343
0.10	0.000394
0.20	0.000646
0.40	0.001730
0.60	0.002179
0.80	0.002414
0.90	0.002351
1.00	0.002173

[a] $v_2^{(s)}$: volume fraction of component 2 in the initial binary solvent mixture calculated as if the dissolved solute were not present.
[b] c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Vortex mixer, constant-temperature bath, and an ultraviolet/visible spectrophotometer.
Binary solvent mixtures were prepared by volume. Excess solute and solvent were placed in sealed containers and equilibrated at a constant temperature for 24 h. During this time the tubes were shaken occasionally on a vortex mixer. Aliquots of saturated solutions were removed, centrifuged, filtered through a sintered glass crucible (grade 4), and diluted quantitatively with l0% aqueous dimethyl sulfoxide for spectroscopic analyses. Concentration of the dissolved solute was determined from the measured absorbance at 263 nm.

Source and Purity of Chemicals:
(1) Purity not given, Ranbaxy Research Laboratories, Gurgaon, India, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.
(3) Purity not given, Analytical Reagent grade, Merck Chemical Company, Ltd., Mumbai, India, no purification details were provided.

Estimated Error:
Temperature: No information given in the paper.
$v_2^{(s)}$: ±0.01.
c_1: ±5.0% (relative error, estimated by compiler).

27. Solubility of Salicylic Acid in Organic Solvents

27.1. Critical evaluation of experimental solubility data

Volumes 90 (Refs. 1 and 2) and 99 (Ref. 3) in the IUPAC-NIST Solubility Data Series contained experimental solubility data for salicylic acid (more formally named 2-hydroxybenzoic acid) in seven saturated hydrocarbons (hexane, heptane, 2,2,4-trimethylpentane, decane, dodecane, hexadecane, and cyclohexane), in three aromatic hydrocarbons (benzene, methylbenzene, and 1,3-dimethylbenzene), in three alkyl alkanoates (ethyl ethanoate, butyl ethanoate, and 1-methylethyl tetradecanoate), in one dialkyl ether (1,1-oxybisethane) and two cyclic ethers (tetrahydrofuran and 1,4-dioxane), in four haloalkanes (trichloromethane, tetrachloromethane, 1,2-dichloroethane, 1,1,1,2,2-pentachloroethane), in two haloalkenes (trichloroethene and tetrachloroethene), in one chlorinated aromatic hydrocarbon (chlorobenzene), in 18 alcohols (methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, 2-butanol, 2-methyl-1-propanol, 2-methyl-2-propanol, 1-pentanol, 1-hexanol, 1-heptanol, 1-octanol, 1-decanol, cyclohexanol, benzenemethanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), in one alkoxyalcohol (2-ethoxyethanol), in four alkanones (propanone, butanone, 2-pentanone, cyclohexanone), in one aromatic ketone (acetophenone), and in several miscellaneous organic solvents (*N*-methyl-2-pyrrolidone, propylene carbonate, dimethyl sulfoxide, formamide, *N*-methylformamide, *N*,*N*-dimethylformamide, ethanenitrile, nitrobenzene, ethanoic acid, propanoic acid, 9(Z)-octadecenoic acid (oleic acid), ethyl 2-hydroxypropanoate, 1-methylethyl 2-hydroxypropanoate, and butyl 2-hydroxypropanoate). The compilations also included salicylic acid solubilities in binary ethanol + ethyl ethanoate, propanone + benzene, ethyl ethanoate + benzene, and heptane + ethanol solvent mixtures. While many of the measurements were performed at 298 K, there is considerable solubility data for other temperatures as well. The compiled solubility data were correlated with the Abraham solvation parameter model. As an informational note, Vol. 90 (Refs. 1 and 2) also contains solubility data for salicylic acid in water and in aqueous-organic solvent mixtures.

Solubility data contained in Vols. 90 (Refs. 1 and 2) and 99 (Ref. 3) will not be republished here. The listing above is provided so that readers will know what solubility data are available in the earlier volume for salicylic acid. There were a few additional solubility measurements found in the published pharmaceutical literature for salicylic acid.[65,105,190] Wang *et al.*[105] determined the mole-fraction solubility of salicylic acid in methanol and polyethylene glycol 300 (PEG 300) at 298 K. Matsuda *et al.*[190] also measured the mole-fraction solubility of salicylic acid in PEG 300 at 298 K. The two sets for PEG 300 do differ, a mole-fraction solubility of $x_1 = 0.4931$ in Ref. 190 versus $x_1 = 0.3921$ in Ref. 105. Rytting *et al.*[65] reported the molar solubility of salicylic acid in PEG 400 at ambient room temperature.

The experimental solubility data for salicylic acid in organic solvents are in Secs. 27.2 and 27.3.

27.2. Salicylic acid solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-Hydroxybenzoic acid (Salicylic acid); $C_7H_6O_3$; [69-72-7]	[105]X. Wang, C. S. Ponder, and D. J. Kirwan, Cryst. Growth Des. **5**, 85 (2005).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2 [a]	x_1 [b]
0.9126	0.08739

[a] x_2: mole fraction of component 2 in the saturated solution.
[b] x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with agitation for 24 to 72 h in a constant-temperature thermostated water bath. Aliquots of saturated solutions were removed and filtered through a membrane filter of 0.22 μm pore size. Concentrations were determined by spectrophotometric analysis at 304 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

27.3. Salicylic acid solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-Hydroxybenzoic acid (Salicylic acid); $C_7H_6O_3$; [69-72-7] (2) Polyethylene glycol 300 (PEG 300)	[190]H. Matsuda, K. Kaburagi, S. Matsumoto, K. Kurihara, K. Tochigi, and K. Tomono, J. Chem. Eng. Data **54**, 480 (2009).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b]
0.5069	0.4931

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated constant-temperature water bath and high-performance liquid chromatograph with uv detector.
Excess solute and solvent were allowed to equilibrate for 24 h in a constant-temperature thermostated water bath. Aliquots of saturated solutions were removed and filtered through a membrane filter of 0.45 μm pore size (Millipore, USA). Concentrations were determined by high-performance liquid chromatography equipped with an UV detector (254 nm detection). Benzene was added to the sample as an internal standard.

Source and Purity of Chemicals:
(1) 99.5%, Wako Pure Chemical Industries, Ltd., Japan, was used without further purification.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-Hydroxybenzoic acid (Salicylic acid); $C_7H_6O_3$; [69-72-7] (2) Polyethylene glycol 300 (PEG 300)	[105]X. Wang, C. S. Ponder, and D. J. Kirwan, Cryst. Growth Des. **5**, 85 (2005).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.6079	0.3921

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]solubility reported in the paper as 297 g of dissolved solute per kilogram of solvent. Mole fraction calculated by compiler assuming a molar mass of 300 g mol^{-1} for PEG 300.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated constant-temperature water bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in a sealed container and allowed to equilibrate with agitation for 24 to 72 h in a constant-temperature thermostated water bath. Aliquots of saturated solutions were removed and filtered through a membrane filter of 0.22 μm pore size. Concentrations were determined by spectrophotometric analysis at 304 nm.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-Hydroxybenzoic acid (Salicylic acid); $C_7H_6O_3$; [69-72-7] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 2.301$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

28. Solubility of Sodium Diclofenac in Organic Solvents

28.1. Critical evaluation of experimental solubility data

Sodium diclofenac is a NSAID agent that is widely used in long-term therapy for individuals suffering with rheumatoid arthritis. There have been several studies[81,100,164,191–195] involving the solubility of sodium diclofenac in organic solvents. Most notably, Bustamante *et al.*[164] measured the mole fraction solubility of sodium diclofenac in 22 different organic solvents, including two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one alkyl alkanoate (ethyl ethanoate), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. The experimental results were combined with measured solubility data for diclofenac and two other carboxylic acid/sodium carboxylate pairs (e.g., 4-aminobenzoic acid/sodium 4-aminobenzoate and salicylic acid/sodium salicylate) in developing a group-contribution method for calculating partial solubility parameters of sodium salts. Minghetti *et al.*[194] determined the solubility of the sodium and potassium salts of diclofenac in different penetration vehicles (1,2-propanediol and oleic acid) at 305 K as part of a study examining transdermal permeation of pharmaceutical salts. Takahashi *et al.*[100] measured the solubility of sodium diclofenac in diethyl butanedioate, diethyl hexanedioate, diisopropyl hexanedioate, and diethyl decanedioate at 305 K in their study concerning the use of fatty diesters as a means to enhance NSAID permeation through skin. Saei *et al.*[192] investigated the solubility behavior of sodium diclofenac in three binary aqueous-alcohol solvent mixtures at 298 K. The authors reported molar sodium diclofenac solubilities in the neat alcohols (methanol, ethanol and 2-propanol) as part of their experimental measurements.

There have been three studies[89,191,195] examining the solubility of sodium diclofenac as a function of temperature. Zilnik *et al.*[191] determined the solubility of sodium diclofenac in ethyl ethanoate, propanone and dimethyl sulfoxide at several temperatures between 293 and 313 K. The experimental solid-liquid equilibrium data were modeled using expressions based on the Nonrandom Two Liquid (NRTL) and UNIQUAC models. The authors found that both solution models provided a reasonably accurate mathematical description of the observed solubility behavior of sodium diclofenac in the three solvents, with average relative deviations between the back-calculated and measured data on the order of 2% or less. Nayak[195] measured the solubility of sodium diclofenac in several natural oils (olive oil, castor oil, sunflower oil, soybean oil, and arachis oil) from 300 to 315 K. Domańska *et al.*[89] determined the mole fraction solubility of sodium diclofenac in both ethanol and 1-octanol at several temperatures using a dynamic method that recorded the temperature at which the last crystal dissolved. The internal consistency of the latter two datasets was assessed by curve-fitting the measured mole fraction solubility data to the Modified Apelblat model [see Eq. (8)] to yield the following representations:

$$\ln x_1 = -13.670 + \frac{115.57}{T} + 1.514 \ln T, \qquad (34)$$

$$\ln x_1 = -79.513 + \frac{114.02}{T} + 13.039 \ln T, \qquad (35)$$

for solubilities in ethanol and 1-octanol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (34) and (35) are MARD = 1.3% and MARD = 5.1%, the latter of which is slightly more than the experimental uncertainty associated with the measured values.

The experimental solubility data for sodium diclofenac in organic solvents are in Secs. 28.2–28.9.

28.2. Sodium diclofenac solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
(2) Heptane; C_7H_{16}; [142-82-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c,d]
0.9815	0.01850

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.
[d]The experimental solubility in heptane is out of line with measured values for other nonpolar solvents, like cyclohexane and benzene. The reported mole fraction solubility of sodium diclofenac in these latter two solvents is significantly smaller.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000317

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.3. Sodium diclofenac solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Benzene; C_6H_6; [71-43-2]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000452

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.4. Sodium diclofenac solubility data in esters

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9843	0.01569

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[191]L. F. Zilnik, A. Jazbinsek, A. Hvala, F. Vrecer, and A. Klamt, Fluid Phase Equilib. **261**, 140 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
293.15	0.00119
298.15	0.00126
303.15	0.00140
308.15	0.00160

[a]s_1: mass/mass solubility of the solute in units of grams of solute per gram of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath, ultrasonic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed flasks, agitated in an ultrasonic bath, and then transferred to a constant-temperature shaker bath for at least 48 h. After phase equilibrium was attained, the excess solid was removed by filtration using a 0.20 μm pore size membrane filter, and the filtrate was diluted with dimethyl sulfoxide. The concentration of the dissolved solute was determined spectrometrically at 285 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Company, Novo mesto, Slovenia, was used as received. The water content of the drug was determined to be 0.49 mass % by Karl Fischer titration.
(2) 99.8+%, Analytical or Chromatographic grade, Merck Chemical Company, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[81]M. A. H. M. Kamal, N. Imura, T. Nabekura, and S. Kitagawa, Chem. Pharm. Bull. **55**, 368 (2007).
Variables:	**Prepared by:**
T/K = 310	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000071$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Very few experimental details were given in the paper. Excess solute and solvent were allowed to equilibrate at 310 K for a period of 24 h. An aliquot of the solution was removed and quickly centrifuged for 2 min. The concentration of the dissolved solute in the supernatant was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries, Osaka, Japan, no purification details were given in the paper.
(2) Purity not given, Nascalai Tesque, Kyoto, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: Insufficient information given in the paper to estimate.
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Diethyl butanedioate; $C_8H_{14}O_4$; [123-25-1]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1286$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Diethyl hexanedioate; $C_{10}H_{18}O_4$; [141-28-6]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1418$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Diisopropyl hexanedioate; $C_{12}H_{22}O_4$; [6938-94-9]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0928$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Diethyl decanedioate; $C_{14}H_{26}O_4$; [110-40-7]	[100]K. Takahashi, H. Sakano, N. Numata, S. Kuroda, and N. Mizuno, Drug Develop. Ind. Pharm. **28**, 1285 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0978$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. Excess solute and solvent were allowed to equilibrate with agitation for 24 h at constant temperature. The saturated solution was removed and filtered through a 0.45 μm membrane filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.
(2) Purity not given, Wako Pure Chemical Industries Company, Ltd., Osaka, Japan, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

28.5. Sodium diclofenac solubility data in ethers

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9995	0.000527

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000535

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.6. Sodium diclofenac solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000493

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9997	0.000307

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000220

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.7. Sodium diclofenac solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Methanol; CH_4O; [67-56-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9401	0.05988

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Methanol; CH_4O; [67-56-1]	[192]A. A. Saei, F. Jabbaribar, M. A. A. Fakhree, W. E. Acree, Jr., and A. Jouyban, J. Drug Delivery Sci. Technol. **18**, 149 (2008).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 1.0466$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in glass bottles and allowed to equilibrate at 298 K with shaking for 24 h. Aliquots of saturated solutions were removed, quickly filtered using a 0.45 μm hydrophilic filter (Millipore, Durapore, Ireland), and the concentration of the dissolved drug was determined by spectrophotometric analysis at 275 nm after suitable dilution with water.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Rasht, Iran, no purification details were provided in the paper.
(2) Purity not given, HPLC grade, Caledon, Georgetown, Canada, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Ethanol; C_2H_6O; [64-17-5]	[192]A. A. Saei, F. Jabbaribar, M. A. A. Fakhree, W. E. Acree, Jr., and A. Jouyban, J. Drug Delivery Sci. Technol. **18**, 149 (2008).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.5202$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in glass bottles and allowed to equilibrate at 298 K with shaking for 24 h. Aliquots of saturated solutions were removed, quickly filtered using a 0.45 μm hydrophilic filter (Millipore, Durapore, Ireland), and the concentration of the dissolved drug was determined by spectrophotometric analysis at 275 nm after suitable dilution with water.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Rasht, Iran, no purification details were provided in the paper.
(2) Purity not given, Absolute, Merck Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Ethanol; C_2H_6O; [64-17-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables: T/K = 298.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9920	0.007983

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Ethanol; C_2H_6O; [64-17-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
292.1	0.9897	0.0103
295.5	0.9895	0.0105
313.1	0.9891	0.0109
333.5	0.9882	0.0118
335.3	0.9877	0.0123

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 2-Propanol; C_3H_8O; [67-63-0]	[192]A. A. Saei, F. Jabbaribar, M. A. A. Fakhree, W. E. Acree, Jr., and A. Jouyban, J. Drug Delivery Sci. Technol. **18**, 149 (2008).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0256$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in glass bottles and allowed to equilibrate at 298 K with shaking for 24 h. Aliquots of saturated solutions were removed, quickly filtered using a 0.45 μm hydrophilic filter (Millipore, Durapore, Ireland), and the concentration of the dissolved drug was determined by spectrophotometric analysis at 275 nm after suitable dilution with water.

Source and Purity of Chemicals:
(1) Purity not given, Sobhan Pharmaceutical Company, Rasht, Iran, no purification details were provided in the paper.
(2) Purity not given, Absolute, Merck Chemical Company, no purification details were provided in the paper.

Estimated Error:
Temperature: ±0.2 K.
c_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9927	0.007293

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharamcol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000293

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[193]A. Fini, G. Fazio, and A. M. Rabasco, Acta Technol. Legis Med. **4**, 33 (1993).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9721	0.02788

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as a mass percent.

Auxiliary Information

Method/Apparatus/Procedure:
An ultraviolet/visible spectrophotometer.
Excess solute and solvent were placed in flasks and allowed to pre-equilibrate at 323 K to facilitate saturation. The temperature was then lowered to 298 K, and the salt excess crystallized. The sample was allowed to equilibrate at 298 K for one week. An aliquot of the sample was removed, centrifuged, and the concentration of the dissolved solute determined spectroscopically at 276 nm after dilution with ethanol.

Source and Purity of Chemicals:
(1) Purity not given, IBSA, Lugano, Switzerland, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, Carlo Erba, Milano, Italy, was used as received.

Estimated Error:
Temperature: ±0.1 K (estimated by compiler).
x_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[89]U. Domańska, A. Pobudkowska, and A. Pelczarska, J. Phys. Chem. B **115**, 2547 (2011).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
293.0	0.9943	0.0057
293.4	0.9933	0.0067
297.1	0.9917	0.0083
303.3	0.9902	0.0098
319.8	0.9810	0.0190

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Thermostated water bath, analytical balance, stirrer, and electronic thermometer.
Solubilities were determined using a dynamic method. Known amounts of solute and solvent were placed inside a Pyrex glass equilibrium cell, which was then placed in a thermostated water bath. The sample was slowly heated (approximately 5 K/h) with continuous stirring. Temperature at which the last crystals disappeared was taken as the temperature of the solution-crystal equilibrium.

Source and Purity of Chemicals:
(1) 99+%, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) 99.8+%, Sigma-Aldrich Chemical Company, was stored over freshly active molecular sieves of type 4 Å.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±3% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9628	0.03720

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000126

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[194]P. Minghetti, F. Cilurzo, A. Casiraghi, L. Montanari, and A. Fini, J. Pharm. Sci. **96**, 814 (2007).
Variables:	**Prepared by:**
T/K = 305	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00178$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at 305 K with vigorous stirring for 72 h. Aliquots of saturated solutions were removed, quickly filtered using a membrane filter, and the concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis at 254 nm after suitable dilution with methanol.

Source and Purity of Chemicals:
(1) 99+%, Dipharma, UD, Italy, no purification details were provided in the paper.
(2) Purity not given, Pharmaceutical grade, Carlo Erba Reagenti, Milano, Italy, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
c_1: ±6% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8237	0.1763

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.8. Sodium diclofenac solubility data in ketones

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Propanone; C_3H_6O; [67-64-1]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000657

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Propanone; C_3H_6O; [67-64-1]	[191]L. F. Zilnik, A. Jazbinsek, A. Hvala, F. Vrecer, and A. Klamt, Fluid Phase Equilib. **261**, 140 (2007).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
293.15	0.00449
298.15	0.00445
303.15	0.00467
308.15	0.00488
313.15	0.00525

[a]s_1: mass/mass solubility of the solute in units of grams of solute per gram of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath, ultrasonic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed flasks, agitated in an ultrasonic bath, and then transferred to a constant-temperature shaker bath for at least 48 h. After phase equilibrium was attained, the excess solid was removed by filtration using a 0.20 μm pore size membrane filter, and the solvent evaporated. The solid residue was then dissolved and diluted with dimethyl sulfoxide. The concentration of the dissolved solute was determined spectrometrically at 285 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Company, Novo mesto, Slovenia, was used as received. The water content of the drug was determined to be 0.49 mass % by Karl Fischer titration.
(2) 99.8+%, Analytical or Chromatographic grade, Merck Chemical Company, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±4% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
(2) Acetophenone; C_8H_8O; [98-86-2]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000508

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

28.9. Sodium diclofenac solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
(2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9956	0.004448

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9604	0.03964

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Formamide; CH_3NO; [75-12-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9434	0.05659

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[164]P. Bustamante, M. A. Peña, and J. Barra, J. Pharm. Pharmacol. **50**, 975 (1998).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9173	0.08269

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for several days at constant temperature. After equilibrium was attained, aliquots of saturated solutions were removed, filtered through 0.2 μm pore size membranes, and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements at 284 nm. The reported solubility represents the average of at least three independent determinations. The density of the saturated solution was determined in order to convert the measured molar solubilities in units of mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) Purity not given, USPA, France, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	[191]L. F. Zilnik, A. Jazbinsek, A. Hvala, F. Vrecer, and A. Klamt, Fluid Phase Equilib. **261**, 140 (2007).
Variables: Temperature	**Prepared by:** W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
293.15	0.112
298.15	0.135
303.15	0.151
308.15	0.182
313.15	0.212

[a]s_1: mass/mass solubility of the solute in units of grams of solute per gram of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature shaker bath, ultrasonic bath, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in sealed flasks, agitated in an ultrasonic bath, and then transferred to a constant-temperature shaker bath for at least 48 h. After phase equilibrium was attained, the excess solid was removed by filtration using a 0.20 μm pore size membrane filter, and diluted with dimethyl sulfoxide. The concentration of the dissolved solute was determined spectrometrically at 285 nm.

Source and Purity of Chemicals:
(1) Purity not given, Pharmaceutical Company, Novo mesto, Slovenia, was used as received. The water content of the drug was determined to be 0.49 mass % by Karl Fischer titration.
(2) 99.5+%, Analytical or Chromatographic grade, Merck Chemical Company, was used as received.

Estimated Error:
Temperature: ±0.1 K.
s_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) (9Z)-Octadecenoic acid (Oleic acid); $C_{18}H_{34}O_2$; [112-80-1]	[194]P. Minghetti, F. Cilurzo, A. Casiraghi, L. Montanari, and A. Fini, J. Pharm. Sci. **96**, 814 (2007).
Variables: T/K = 305	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0000786$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Magnetic stirrer and a high-performance liquid chromatograph.
Excess solute and solvent were allowed to equilibrate at 305 K with vigorous stirring for 72 h. Aliquots of saturated solutions were removed, quickly filtered using a membrane filter, and the concentration of the dissolved drug was determined by high-performance liquid chromatographic analysis at 254 nm after suitable dilution with methanol.

Source and Purity of Chemicals:
(1) 99+%, Dipharma, UD, Italy, no purification details were provided in the paper.
(2) Purity not given, Pharmaceutical grade, Polichimica, Bologna, Italy, no purification details were provided in the paper.

Estimated Error:
Temperature: ±1 K.
c_1: ±6% (relative error).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Olive oil	[195]A. K. Nayak, Chemistry **19**, 121 (2010).
Variables: Temperature	**Prepared by:** W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
300	0.00292
305	0.00300
310	0.00308
315	0.00331

[a]s_1: mass/volume solubility of the solute in units of grams of solute per cm^3 of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Analytical balance and an UV/visible spectrophotometer.
Very few experimental details were provided in the paper. Excess solute and solvent were allowed to equilibrate with agitation for 24 h. An aliquot of the solution was removed and filtered through a 0.45 μm pore size membrane filter. The concentration of the dissolved drug was determined by spectrophotometric analysis after dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Techno Remedies, Kolkata, India, no purification details were given in the paper.
(2) Purity not given, RP Oomerbhoy Pvt. Ltd., India, no purification details were given in the paper.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±15% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Castor oil	[195]A. K. Nayak, Chemistry **19**, 121 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
300	0.01608
305	0.01632
310	0.01650
315	0.01712

[a]s_1: mass/volume solubility of the solute in units of grams of solute per cm^3 of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Analytical balance and an UV/visible spectrophotometer.
Very few experimental details were provided in the paper. Excess solute and solvent were allowed to equilibrate with agitation for 24 h. An aliquot of the solution was removed and filtered through a 0.45 μm pore size membrane filter. The concentration of the dissolved drug was determined by spectrophotometric analysis after dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Techno Remedies, Kolkata, India, no purification details were given in the paper.
(2) Purity not given, BD Pharmaceutical Works, India, no purification details were given in the paper.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Arachis oil	[195]A. K. Nayak, Chemistry **19**, 121 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
300	0.00709
305	0.00723
310	0.00733
315	0.00760

[a]s_1: mass/volume solubility of the solute in units of grams of solute per cm^3 of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Analytical balance and an UV/visible spectrophotometer.
Very few experimental details were provided in the paper. Excess solute and solvent were allowed to equilibrate with agitation for 24 h. An aliquot of the solution was removed and filtered through a 0.45 μm pore size membrane filter. The concentration of the dissolved drug was determined by spectrophotometric analysis after dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Techno Remedies, Kolkata, India, no purification details were given in the paper.
(2) Purity not given, B. D. & Company, India, no purification details were given in the paper.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Sunflower oil	[195]A. K. Nayak, Chemistry **19**, 121 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
300	0.00520
305	0.00538
310	0.00560
315	0.00608

[a]s_1: mass/volume solubility of the solute in units of grams of solute per cm^3 of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Analytical balance and an UV/visible spectrophotometer.
Very few experimental details were provided in the paper. Excess solute and solvent were allowed to equilibrate with agitation for 24 h. An aliquot of the solution was removed and filtered through a 0.45 μm pore size membrane filter. The concentration of the dissolved drug was determined by spectrophotometric analysis after dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Techno Remedies, Kolkata, India, no purification details were given in the paper.
(2) Purity not given, Amrit Banaspati Company, Ltd., India, no purification details were given in the paper.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±10% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-(2,6-Dichloroanilino)-phenylacetic acid sodium salt (Sodium diclofenac); $C_{14}H_{10}Cl_2NNaO_2$; [15307-79-6] (2) Soybean oil	[195]A. K. Nayak, Chemistry **19**, 121 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
300	0.00309
305	0.00312
310	0.00330
315	0.00363

[a]s_1: mass/volume solubility of the solute in units of grams of solute per cm^3 of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Analytical balance and an uv/visible spectrophotometer.
Very few experimental details were provided in the paper. Excess solute and solvent were allowed to equilibrate with agitation for 24 h. An aliquot of the solution was removed and filtered through a 0.45 μm pore size membrane filter. The concentration of the dissolved drug was determined by spectrophotometric analysis after dilution with methanol.

Source and Purity of Chemicals:
(1) Purity not given, Techno Remedies, Kolkata, India, no purification details were given in the paper.
(2) Purity not given, Adani Wilmer Ltd., India, no purification details were given in the paper.

Estimated Error:
Temperature: No information given in the paper.
s_1: ±10% (relative error, estimated by compiler).

29. Solubility of Sodium Ibuprofen in Organic Solvents

29.1. Critical evaluation of experimental solubility data

Sodium ibuprofen tablets contain the active ingredient ibuprofen, which is commonly used in pain treatment therapies for dysmenorrhea, headache, rheumatism, and arthritis. Ibuprofen free acid is the most commonly used form of ibuprofen in commercial pharmaceutical formulations. Poor solubility of ibuprofen in aqueous solutions lessens the drug's dissolution and adsorption rates into the bloodstream. The sodium salt, however, more readily dissolves in water and overcomes many of these problems. There has been one study involving the solubility of sodium ibuprofen in organic solvents. Bustamante *et al.*[93] measured the mole-fraction solubility of sodium ibuprofen in 25 different organic solvents, including two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one alkyl alkanoate (ethyl ethanoate), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and five miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, *N*-methylformamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Results of the experimental measurements were used in conjunction with the modified extended Hansen method to calculate partial solubility parameters of sodium salts of carboxylic acids containing a single hydrogen bonding group (ibuprofen/sodium ibuprofen and benzoic acid/sodium benzoate). Critical evaluation of the experimental data is not possible because the measurements were performed at only a single temperature, and there are no independent experimental solubility data for sodium ibuprofen in the 25 solvents studied by Bustamante *et al.*

The experimental solubility data for sodium ibuprofen in organic solvents are in Secs. 29.2–29.9.

29.2. Sodium ibuprofen solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Heptane; C_7H_{16}; [142-82-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000124

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000854

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.3. Sodium ibuprofen solubility data in aromatic hydrocarbons

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Benzene; C_6H_6; [71-43-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000454

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.4. Sodium ibuprofen solubility data in esters

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9994	0.000620

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.5. Sodium ibuprofen solubility data in ethers

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9994	0.000605

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9998	0.000164

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.6. Sodium ibuprofen solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9996	0.000413

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000374

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Chlorobenzene; C_6H_5Cl; [108-90-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.00000234

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.7. Sodium ibuprofen solubility data in alcohols

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Methanol; CH_4O; [67-56-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7306	0.2694

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Ethanol; C_2H_6O; [64-17-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9225	0.07751

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9433	0.05669

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9329	0.06708

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.4915	0.5085

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7570	0.2430

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,3-Propanediol; $C_3H_8O_2$; [504-63-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8905	0.1095

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,4-Butanediol; $C_4H_{10}O_2$; [110-63-4]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7547	0.2453

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7178	0.2822

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.8. Sodium ibuprofen solubility data in ketones

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Propanone; C_3H_6O; [67-64-1]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9996	0.000377

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Acetophenone; C_8H_8O; [98-86-2]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000428

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

29.9. Sodium ibuprofen solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9667	0.03334

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9695	0.03054

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) Formamide; CH_3NO; [75-12-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9784	0.02158

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) *N*-Methylformamide; C_2H_5NO; [123-39-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9981	0.00190

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) α-Methyl-4-(2-methylpropyl)-benzeneacetic acid, sodium salt (Sodium ibuprofen); $C_{13}H_{17}NaO_2$; [31121-93-4] (2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	[93]P. Bustamante, M. A. Peña, and J. Barra, Int. J. Pharm. **194**, 117 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9988	0.00115

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

30. Solubility of Sodium Naproxen in Organic Solvents

30.1. Critical evaluation of experimental solubility data

Sodium naproxen is a NSAID that is used to provide relief from mild to moderate aches and pains. There have been two experimental studies[196,197] reporting the solubility of sodium naproxen in organic solvents. Delgado *et al.*[196] determined the solubility of sodium naproxen in binary aqueous-ethanol solvent mixtures over the entire composition range, including the two pure solvents. Measurements were performed in 5 K increments between 278 and 308 K. The internal consistency of the Delgado *et al.* dataset was assessed by curve-fitting the measured mole-fraction solubility data to the Modified Apelblat model [Eq. (8)] to yield the following representation:

$$\ln x_1 = -37.951 + \frac{-17.656}{T} + 6.049 \ln T. \qquad (36)$$

The mean absolute relative deviation between the observed experimental data and back-calculated values based on Eq. (36) of MARD = 6.8% is slightly larger in magnitude than the experimental uncertainty associated with the measured values.

Chavez and Rousseau[197] measured the solubility of sodium naproxen in binary aqueous-methanol and aqueous-ethanol solvent mixtures as a function of composition from 283 to 313 K. Analysis of the experimental data using van't Hoff $\ln x_1$ versus $1/T$ graphs indicated that different crystalline forms (hydrates, alcohol solvates, and anhydrates) existed in the different binary solvent composition–temperature regions. The authors used thermal analysis and powder x-ray diffraction to confirm the different forms of the equilibrated solid residue.

The experimental solubility data for sodium naproxen in alcohols are given in Sec. 30.2.

30.2. Sodium naproxen solubility data in alcohols

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Sodium naproxen); $C_{14}H_{13}NaO_3$; [26159-34-2] (2) Methanol; CH_4O; [67-56-1]	[197]K. J. Chavez and R. W. Rousseau, Cryst. Growth Des. **10**, 3802 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
283.6	214
288.5	216
293.6	224
298.5	244
303.1	242
307.6	243
312.1	243

[a]s_1: solubility of component 1 in the saturated solution in units of grams of solute per kilogram of saturated solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, mechanical stirrer, and a high-performance liquid chromatograph equipped with UV/visible detection.
Slurry solutions were prepared by batch cooling crystallization. Solvent was allowed to reach the desired temperature, and then sodium naproxen was slowly added with stirring until the added solid no longer dissolved. The temperature of the solution was then raised to about 10 °C above the desired equilibrium temperature so that all of the existing crystals dissolved. The solution was then cooled at an approximate rate of 0.6 °C/min to the desired equilibrium temperature. The solution was allowed to equilibrate for at least 15 h. Samples of the saturated solution were then removed by syringe and filtered through a 0.2 μm filter. The concentration of the solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, anhydrous, Albermarle Corporation, was used as received.
(2) Purity not given, HPLC grade, Fisher Scientific, USA, was dried overnight over molecular sieves prior to use.

Estimated Error:
Temperature: No information provided.
s_1: ±4% (relative error).

Components:	**Original Measurements:**
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Sodium naproxen); $C_{14}H_{13}NaO_3$; [26159-34-2] (2) Ethanol; C_2H_6O; [64-17-5]	[196]D. R. Delgado, M. A. Ruidiaz, S. M. Gómez, and F. Martínez, Quim. Nova **33**, 1923 (2010).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b]
278.15	0.9822	0.01781
283.15	0.9793	0.02065
288.15	0.9761	0.02392
293.15	0.9728	0.02723
298.15	0.9693	0.03074
303.15	0.9646	0.03538
308.15	0.9609	0.03913

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker, constant-temperature water bath, and an analytical balance.
Excess solute and solvent were placed in a stoppered glass flask and stirred in a mechanical shaker for 4 h. The flasks were then transferred to a constant-temperature bath where the solution equilibrated for at least seven days. A weighed aliquot of the saturated solution was removed, isothermally filtered, and the solvent was allowed to evaporate until a constant mass was obtained. The solubility of dissolved solute was calculated from the mass of solid residue and the mass of the sample analyzed. The reported values represent the average of at least three determinations. The densities of the saturated solutions were measured in order to convert the molar solubilities given in mol dm^{-3} to mole fractions.

Source and Purity of Chemicals:
(1) 99.9%, chemical source not specified, no purification details were given in the paper.
(2) 99.9%, Merck Chemical Company, Germany, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.05 K.
x_1: ±2% (relative error).

Components:
(1) (S)-6-Methoxy-α-methyl-2-naphthaleneacetic acid (Sodium naproxen); $C_{14}H_{13}NaO_3$; [26159-34-2]
(2) Ethanol; C_2H_6O; [64-17-5]

Original Measurements:
[197]K. J. Chavez and R. W. Rousseau, Cryst. Growth Des. **10**, 3802 (2010).

Variables:
Temperature

Prepared by:
W. E. Acree, Jr.

Experimental Values

T/K	s_1[a]
284.2	14
288.8	16
293.7	19
298.3	23
302.9	26
307.7	28
312.6	30

[a]s_1: solubility of component 1 in the saturated solution in units of grams of solute per kilogram of saturated solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, mechanical stirrer, and a high-performance liquid chromatograph equipped with UV/visible detection.
Slurry solutions were prepared by batch cooling crystallization. Solvent was allowed to reach the desired temperature, and then sodium naproxen was slowly added with stirring until the added solid no longer dissolved. The temperature of the solution was then raised to about 10 °C above the desired equilibrium temperature so that all of the existing crystals dissolved. The solution was then cooled at an approximate rate of 0.6 °C/min to the desired equilibrium temperature. The solution was then allowed to equilibrate for at least 15 h. Samples of the saturated solution were then removed by syringe and filtered through a 0.2 μm filter. The concentration of the solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, anhydrous, Albermarle Corporation, was used as received.
(2) Purity not given, HPLC grade, VWR Scientific, USA, was dried overnight over molecular sieves prior to use.

Estimated Error:
Temperature: No information provided.
s_1: ±3%–6% (relative error).

31. Solubility of Sodium Salicylate in Organic Solvents

31.1. Critical evaluation of experimental solubility data

Sodium salicylate is the sodium salt of salicylic acid and is used in medicine as a pain reliever and fever reducer. Published studies have shown that sodium salicylate induces apoptosis in Myeloid Leukemia cell lines[198] and in human lung adenocarcinoma cells.[199] There have been several studies[77,200,201] involving the solubility of sodium salicylate in organic solvents. Most notably, Barra *et al.*[77] measured the mole-fraction solubility of sodium salicylate in 22 different organic solvents, including two saturated hydrocarbons (heptane and cyclohexane), one aromatic hydrocarbon (benzene), one alkyl alkanoate (ethyl ethanoate), one dialkyl ether (1,1′-oxybisethane) and one cyclic ether (1,4-dioxane), two chloroalkanes (trichloromethane and 1,2-dichloroethane) and one chlorinated aromatic hydrocarbon (chlorobenzene), seven alcohols (methanol, ethanol, 1-pentanol, 1-octanol, 1,2-ethanediol, 1,2-propanediol, and 1,2,3-propanetriol), one alkanone (propanone) and one aromatic ketone (acetophenone), and four miscellaneous organic solvents (ethanoic acid, propanoic acid, formamide, and *N*,*N*-dimethylformamide) at 298 K and atmospheric pressure. Puruta and Mauger[201] investigated the solubility of sodium salicylate at 298 K in binary solvent mixtures containing water with either 1,4-dioxane, methanol, ethanol, 1-propanol, or propanone. The experimental data were presented only in graphical format in the paper, and did include the solubilities in the five neat organic cosolvents.

The experimental solubility data for sodium salicylate in organic solvents are in Secs. 31.2–31.9.

31.2. Sodium salicylate solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) Heptane; C_7H_{16}; [142-82-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000246

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) Cyclohexane; C_6H_{12}; [110-82-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000330

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.3. Sodium salicylate solubility data in aromatic hydrocarbons

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) Benzene; C_6H_6; [71-43-2]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000356

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.4. Sodium salicylate solubility data in esters

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9986	0.001415

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.5. Sodium salicylate solubility data in ethers

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) 1,1′-Oxybisethane; $C_4H_{10}O$; [60-29-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9991	0.000871

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) 1,4-Dioxane; $C_4H_8O_2$; [123-91-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9991	0.000870

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.6. Sodium salicylate solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]
(2) Trichloromethane; $CHCl_3$; [67-66-3]

Original Measurements:
[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000461

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]
(2) 1,2-Dichloroethane; $C_2H_4Cl_2$; [107-06-2]

Original Measurements:
[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000547

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]
(2) Chlorobenzene; C_6H_5Cl; [108-90-7]

Original Measurements:
[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).

Variables:
T/K = 298.15

Prepared by:
W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000351

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.7. Sodium salicylate solubility data in alcohols

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Methanol; CH_4O; [67-56-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9460	0.05399

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9875	0.01246

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[200]W. Schnellbach, Am. J. Pharm. **101**, 586 (1929).
(2) Ethanol; C_2H_6O; [64-17-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9631	0.03686

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as 11.74 g of sodium salicylate present in 100 g of solution.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature water bath, mechanical stirring apparatus, and an analytical balance.
Excess solute and solvent were placed in a tightly stoppered Pyrex glass test tube, and constantly shaken by mechanical stirring in a constant-temperature water bath. After four days, a portion of the solution was withdrawn and quickly filtered. A portion of the solution was then weighed in a weighing bottle and the solvent was allowed to evaporate. The solid residue was dried at 373 K until a constant mass was obtained. The solubility was calculated from the mass of the solid residue and the mass of the saturated sample taken for analysis.

Source and Purity of Chemicals:
(1) Purity not given, chemical source not specified, no purification details were provided.
(2) Purity not given, USP, no purification details were provided.

Estimated Error:
Temperature: ±0.005 K.
x_1: ±4% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) 1-Pentanol; $C_5H_{12}O$; [71-41-0]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9966	0.003397

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9947	0.005253

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) 1,2-Ethanediol; $C_2H_6O_2$; [107-21-1]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7358	0.2642

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.7971	0.2029

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8832	0.1168

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.8. Sodium salicylate solubility data in ketones

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7] (2) Propanone; C_3H_6O; [67-64-1]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9877	0.01230

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Acetophenone; C_8H_8O; [98-86-2]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9999	0.0000456

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and the solvent evaporated. The solid residue was then dissolved and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

31.9. Sodium salicylate solubility data in miscellaneous organic solvents

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Ethanoic acid; $C_2H_4O_2$; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9916	0.00835

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Propanoic acid; $C_3H_6O_2$; [79-09-4]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.9762	0.02378

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) Formamide; CH_3NO; [75-12-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.8009	0.1991

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

Components:	Original Measurements:
(1) 2-Hydroxybenzoic acid, sodium salt (Sodium salicylate); $C_7H_5NaO_3$; [54-21-7]	[77]J. Barra, M.-A. Peña, and P. Bustamante, Eur. J. Pharm. Sci. **10**, 153 (2000).
(2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298.15	W. E. Acree, Jr.

Experimental Values

x_2[a]	x_1[b,c]
0.6098	0.3902

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Experimental value was reported in the paper as ln x_1.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an ultraviolet/visible spectrophotometer. Excess solute and solvent were placed in flasks and allowed to equilibrate with shaking for five days at constant temperature. Aliquots of saturated solutions were removed and diluted with 96% ethanol (v/v). Concentrations were determined by spectrophotometric measurements. The reported solubility represents the average of at least three independent determinations.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, USA, no purification details were provided.
(2) Purity not given, Spectroscopic or Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.2 K.
x_1: ±2% (relative error).

32. Solubility of Tenoxicam in Organic Solvents

32.1. Critical evaluation of experimental solubility data

Tenoxicam (more formally named 4-hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide) is a NSAID used to relieve pain and inflammation in individuals having osteoarthritis, rheumatoid arthritis, bursitis, tendinitis, and periarthritis of the shoulders or hips. There have been four published studies[64,65,202,203] involving the solubility of tenoxicam in organic solvents. Yeh *et al.*[202] determined the molar solubility of tenoxicam in ethyl ethanoate, dichloromethane, trichloromethane, methanol, ethanol, 1,2-propanediol, propanone, dimethyl sulfoxide, *N*,*N*-dimethylformamide, and *N*,*N*-dimethylacetamide at 298 K as part of a study regarding improving the solubility and bioavailability of poorly water-soluble drugs through the use of aqueous-organic cosolvent systems. Gwak and Chun[203] examined the effect of pharmaceutical formulation vehicles and penetration enhancers on the *in vitro* permeation of tenoxicam through hairless mouse skin from saturated solutions. The authors measured the solubility of tenoxicam in 1-methylethyl tetradecanoate (commonly called isopropyl myristate), ethanol, 1,2-propanediol, 2-(2-methoxyethoxy)ethanol, and polyethylene glycol 400 (PEG 400) at 305 K. Wenkers and Lippold[64] reported solubility data for ten NSAIDs (aspirin, diclofenac, diflunisal, flufenamic acid, ibuprofen, ketoprofen, nabumetone, naproxen, piroxicam, and tenoxicam) in light mineral oil at 305 K. It is not possible to perform a critical evaluation as most of the measurements were performed at only a single temperature, and there are at most only two independent experimental values for the common solvents studied by both groups. Rytting *et al.*[65] studied the solubility of tenoxicam in PEG 400 at ambient room temperature.

The experimental solubility data for tenoxicam in organic solvents are in Secs. 32.2–32.7.

32.2. Tenoxicam solubility data in esters

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Ethyl ethanoate; $C_4H_8O_2$; [141-78-6]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00841$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) 1-Methylethyl tetradecanoate; $C_{17}H_{34}O_2$; [110-27-0]	[203]H. S. Gwak and I. K. Chun, Int. J. Pharm. **236**, 57 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000474$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with shaking at a constant temperature for 48 h. Aliquots of saturated solutions were removed, centrifuged at 10 000 rpm for 5 min, and the concentration of the dissolved drug in the supernatant was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Dong-A Pharmaceutical Company, Ltd., Seoul, South Korea, no purification details were provided.
(2) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±20% (relative error).

32.3. Tenoxicam solubility data in haloalkanes, haloalkenes, and haloaromatic hydrocarbons

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Dichloromethane; CH_2Cl_2; [75-09-2]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0474$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Trichloromethane; $CHCl_3$; [67-66-3]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0544$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

32.4. Tenoxicam solubility data in alcohols

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Methanol; CH_4O; [67-56-1]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00191$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, HPLC grade, Fisher Scientific Chemical Company, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Ethanol; C_2H_6O; [64-17-5]	[203]H. S. Gwak and I. K. Chun, Int. J. Pharm. **236**, 57 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00205$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with shaking at a constant temperature for 48 h. Aliquots of saturated solutions were removed, centrifuged at 10 000 rpm for 5 min, and the concentration of the dissolved drug in the supernatant was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Dong-A Pharmaceutical Company, Ltd., Seoul, South Korea, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±30% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Ethanol; C_2H_6O; [64-17-5]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).

Variables:	Prepared by:
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000987$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[203]H. S. Gwak and I. K. Chun, Int. J. Pharm. **236**, 57 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00282$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with shaking at a constant temperature for 48 h. Aliquots of saturated solutions were removed, centrifuged at 10 000 rpm for 5 min, and the concentration of the dissolved drug in the supernatant was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Dong-A Pharmaceutical Company, Ltd., Seoul, South Korea, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±20% (relative error).

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.00254$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

32.5. Tenoxicam solubility data in alkoxyalcohols

Components:	Original Measurements:
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) 2-(2-Methoxyethoxy)ethanol; $C_5H_{12}O_3$; [111-77-3]	[203]H. S. Gwak and I. K. Chun, Int. J. Pharm. **236**, 57 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.01405$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with shaking at a constant temperature for 48 h. Aliquots of saturated solutions were removed, centrifuged at 10 000 rpm for 5 min, and the concentration of the dissolved drug in the supernatant was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Dong-A Pharmaceutical Company, Ltd., Seoul, South Korea, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±2% (relative error).

32.6. Tenoxicam acid solubility data in ketones

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
(2) Propanone; C_3H_6O; [67-64-1]	
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.01033$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

32.7. Tenoxicam solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
(2) Dimethyl sulfoxide; C_2H_6OS; [67-68-5]	
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.210$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
(2) *N*,*N*-Dimethylformamide; C_3H_7NO; [64-19-7]	
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0502$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ± 1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) *N*,*N*-Dimethylacetamide; C_4H_9NO; [127-19-5]	[202]M.-K. Yeh, L.-C. Chang, and A. H.-J. Chiou, AAPS PharmSciTech **10**, 166 (2009).
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.1143$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and a high-performance liquid chromatograph. 500 mg of tenoxicam was dissolved in 5 cm^3 of solvent in a tightly closed test tube within a water bath, and then the test tubes were kept on a rotary shaker at a speed of 125 rpm for 48 h to attain equilibrium. 3 cm^3 of the saturated solution was then filtered through a 0.45 μm pore size filter. The concentration of the dissolved solute was determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, Analytical Reagent grade, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±1 K (estimated by compiler).
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Polyethylene glycol 400 (PEG 400)	[203]H. S. Gwak and I. K. Chun, Int. J. Pharm. **236**, 57 (2002).
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.03260$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer
Excess solute and solvent were placed in sealed bottles and allowed to equilibrate with shaking at a constant temperature for 48 h. Aliquots of saturated solutions were removed, centrifuged at 10 000 rpm for 5 min, and the concentration of the dissolved drug in the supernatant was determined by high-performance liquid chromatographic analysis after suitable dilution.

Source and Purity of Chemicals:
(1) Purity not given, Dong-A Pharmaceutical Company, Ltd., Seoul, South Korea, no purification details were provided.
(2) Purity not given, chemical source not specified, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±2% (relative error).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1,2-thiazine-3-carboxamide-1,1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4] (2) Polyethylene glycol 400 (PEG 400)	[65]E. Rytting, K. A. Lentz, X.-Q. Chen, F. Qian, and S. Venkatesh, AAPS J. **7**, E78 (2005).
Variables:	**Prepared by:**
T/K = 296	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0158$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Centrifuge and a high-performance liquid chromatograph equipped with a photo-diode array detector.
Excess solute and solvent were placed in sealed vials and shaken at ambient room temperature for at least 24 h. The vials were then centrifuged for 15 min to separate the saturated solution from the excess solute. The supernatant was then filtered and the concentration of the dissolved solute determined by high-performance liquid chromatographic analysis.

Source and Purity of Chemicals:
(1) Purity not given, Sigma-Aldrich Chemical Company, St. Louis, Missouri, USA, no purification details were provided.
(2) Purity not given, J. T. Baker Chemical Company, Phillipsburg, New Jersey, USA, no purification details were provided.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±10% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-Hydroxy-2-methyl-*N*-2-pyridinyl-2*H*-thieno[2,3-*e*]-1, 2-thiazine-3-carboxamide-1, 1-dioxide (Tenoxicam); $C_{13}H_{11}N_3O_4S_2$; [59804-37-4]	[64]B. P. Wenkers and B. C. Lippold, J. Pharm. Sci. **88**, 1326 (1999).
(2) Mineral oil	
Variables:	**Prepared by:**
T/K = 305.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0000264$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer. Excess solute and solvent were placed in sealed bottles and allowed to equilibrate at a constant temperature with rotation for 24 h. Aliquots of saturated solutions were removed, filtered through a 0.45 μm cellulose acetate membrane filter, and diluted quantitatively for spectroscopic analysis. Reported values represent the average of three experimental measurements.

Source and Purity of Chemicals:
(1) Purity not given, Hoffmann-La Roche, Basel, Switzerland, no purification details were provided.
(2) Purity not given, Bayer Leverkusen and Rhone Poulenc Rorer, Cologne, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±10% (relative error).

33. Solubility of Tolfenamic Acid in Organic Solvents

33.1. Critical evaluation of experimental solubility data

Tolfenamic acid (more formally named 2-[(3-chloro-2-methylphenyl)amino]benzoic acid) is an orally administered NSAID used to treat symptoms of migraines and headaches. Tolfenamic acid has recently been reported to inhibit tumor growth and lung, esophageal, breast, pancreatic, and colon cancer cell growth.[204] Subaiea *et al.*[205] found that short-term treatment of Alzheimer's disease mice attenuated long-term memory as determined using Morris water maze and y-maze experiments. There have been two published studies[86,206] reporting solubility data involving tolfenamic acid in organic solvents. Persson *et al.*[206] measured the solubility of 30 diverse drug molecules in soybean oil and polyethylene glycol 400 (PEG 400) at 310 K. Tolfenamic acid was one of the drug molecules studied. The solubility data were reported in the paper in the form of a bar graph. Surov *et al.*[86] determined the solubility of tolfenamic acid in both hexane and 1-octanol at five temperatures from 293 to 315 K using a spectrophotometric method of analysis. The internal consistency of the two datasets was assessed by curve-fitting the measured mole fraction solubility data to the Modified Apelblat model [Eq. (8)] to yield the following representations:

$$\ln x_1 = -137.503 + \frac{113.777}{T} + 22.219 \ln T \qquad (37)$$

$$\ln x_1 = -43.449 + \frac{114.917}{T} + 6.958 \ln T \qquad (38)$$

for solubilities in hexane and 1-octanol, respectively. The mean absolute relative deviations between the observed experimental data and back-calculated values based on Eqs. (37) and (38) of MARD = 1.1% and MARD = 1.7% are less than the experimental uncertainty associated with the measured values.

The experimental solubility data for tolfenamic acid in organic solvents are given in Secs. 33.2–33.3.

33.2. Tolfenamic acid solubility data in saturated hydrocarbons (including cycloalkanes)

Components:	**Original Measurements:**
(1) 2-[(3-Chloro-2-methylphenyl)-amino]benzoic acid (Tolfenamic acid); $C_{14}H_{12}ClNO_2$; [13710-19-5]	[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009).
(2) Hexane; C_6H_{14}; [110-54-3]	
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b,c]
293.2	0.9999	0.0000182
298.2	0.9999	0.0000274
303.2	0.9999	0.0000386
310.2	0.9999	0.0000628
315.2	0.9999	0.0000900

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Solubility of the white form of tolfenamic acid.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Solvents Documentation Syntheses (SDS), Peypin, France, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

33.3. Tolfenamic acid solubility data in alcohols

Components:	**Original Measurements:**
(1) 2-[(3-Chloro-2-methylphenyl)-amino]benzoic acid (Tolfenamic acid); $C_{14}H_{12}ClNO_2$; [13710-19-5] (2) 1-Octanol; $C_8H_{18}O$; [111-87-5]	[86]A. O. Surov, P. Szterner, W. Zielenkiewicz, and G. L. Perlovich, J. Pharm. Biomed. Anal. **50**, 831 (2009).
Variables: Temperature	**Prepared by:** W. E. Acree, Jr.

Experimental Values

T/K	x_2[a]	x_1[b,c]
293.2	0.9708	0.0292
298.2	0.9668	0.0332
303.2	0.9640	0.0360
310.2	0.9561	0.0439
315.2	0.9536	0.0464

[a]x_2: mole fraction of component 2 in the saturated solution.
[b]x_1: mole fraction solubility of the solute.
[c]Solubility of the white form of tolfenamic acid.

Auxiliary Information

Method/Apparatus/Procedure:
Air thermostat, analytical balance, and an UV/visible spectrophotometer. Excess solute and solvent were placed in a glass ampoule and allowed to equilibrate with rotation at constant temperature in an air thermostat for 24 h. An aliquot of the saturated solution was removed with isothermal filtration (Acrodisc CR syringe filter, PTFE, 0.2 μm pore size), and diluted quantitatively. The molar solubility of the drug was determined by spectrophotometric analysis. The solubility determination was repeated three times.

Source and Purity of Chemicals:
(1) 99.8+%, Sigma Chemical Company, St. Louis, Missouri, USA, was used as received.
(2) Purity not given, Analytical Reagent Grade, Sigma Chemical Company, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
x_1: ±2.5% (relative error).

34. Solubility of Valdecoxib in Organic Solvents

34.1. Critical evaluation of experimental solubility data

There have been four publications[207–210] reporting the solubility of valdecoxib (more formally named 4-(5-methyl-3-phenylisoxazol-4-yl)benzenesulfonamide) in organic solvents. Liu and co-workers[208,209] determined the molar solubility of valdecoxib in ethanol, 1,2-propanediol, 1,2,3-propanetriol, and propylene glycol 400 (PEG 400) at only three temperatures from 298 to 308 K. The studies examined the effect of the cosolvent on enhancing the solubility of drugs exhibiting low aqueous solubility. At the time of the experimental measurements, valdecoxib had been recently recommended as a NSAID for the management of osteoarthritis, pain, and dysmenorrhea. Very poor aqueous solubility of valdecoxib, however, led to difficulties in the design of both oral and injectable pharmaceutical formulations. Later, valdecoxib was withdrawn from the world market because of its association with cardiovascular risk. Desai and Park[207] measured the molar solubility of valdecoxib in methanol, ethanol, and 1,2,3-propanetriol at 310 K, and Chaudhar *et al.*[210] reported the solubility of valdecoxib in PEG 400 at 298 K. The solubility data of Liu *et al.* for valdecoxib in PEG 400 at 298 K differs significantly from that reported by Chaudhar *et al.*; a value of $c_1 = 0.00679$ mol dm^{-3} (Ref. 207) versus $c_1 = 0.117$ mol dm^{-3} (Ref. 210). The difference between the two sets of independent experimental measurements is more than would be expected based on differences in chemical purities and experimental methodologies. It is not possible to perform a critical evaluation of the experimental data as there are too few measurements in any common solvent to permit a meaningful analysis.

The experimental solubility data for valdecoxib in organic solvents are given in Secs. 34.2 and 34.3.

34.2. Valdecoxib solubility data in alcohols

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) Methanol; CH_4O; [67-56-1]	[207]K. G. H. Desai and H. J. Park, Drug Develop. Res. **62**, 41 (2004).
Variables: T/K = 310.15	**Prepared by:** W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.212$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap test tubes and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter (Millipore USA), and diluted for spectroscopic analysis at 203 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Duksan Chemicals, Kyungkido, South Korea, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) Ethanol; C_2H_6O; [64-17-5]	[207]K. G. H. Desai and H. J. Park, Drug Develop. Res. **62**, 41 (2004).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.0454$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap test tubes and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter (Millipore USA), and diluted for spectroscopic analysis at 203 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Duksan Chemicals, Kyungkido, South Korea, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±1% (relative error).

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) Ethanol; C_2H_6O; [64-17-5]	[208]C. Liu, K. G. H. Desai, and C. Liu, J. Chem. Eng. Data **49**, 1847 (2004).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
298.15	0.0307
303.15	0.0431
308.15	0.0493

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap tubes and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted for spectroscopic analysis at 201 nm.

Source and Purity of Chemicals:
(1) 99.6%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemical Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±2.5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) 1,2-Propanediol; $C_3H_8O_2$; [57-55-6]	[209]C. Liu, K. G. H. Desai, X. Chen, and X. Tang, J. Chem. Eng. Data **50**, 1736 (2005).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
298.15	0.00456
303.15	0.00613
308.15	0.00934

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap tubes and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted for spectroscopic analysis at 201 nm.

Source and Purity of Chemicals:
(1) 99.6%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemical Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±2.5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[209]C. Liu, K. G. H. Desai, X. Chen, and X. Tang, J. Chem. Eng. Data **50**, 1736 (2005).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
298.15	0.000160
303.15	0.000180
308.15	0.000192

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap tubes and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted for spectroscopic analysis at 201 nm.

Source and Purity of Chemicals:
(1) 99.6%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemical Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±5% (relative error, estimated by compiler).

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) 1,2,3-Propanetriol (Glycerol); $C_3H_8O_3$; [56-81-5]	[207]K. G. H. Desai and H. J. Park, Drug Develop. Res. **62**, 41 (2004).
Variables:	**Prepared by:**
T/K = 310.15	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.000193$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap test tubes and allowed to equilibrate in a constant-temperature shaker bath for 48 h. An aliquot of the saturated solution was removed, filtered through a 0.2 μm membrane filter (Millipore USA), and diluted for spectroscopic analysis at 203 nm. Reported values represent the average of three experimental determinations.

Source and Purity of Chemicals:
(1) Purity not given, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Sigma Chemical Company, Steinhein, Germany, no purification details were provided.

Estimated Error:
Temperature: ±0.5 K (estimated by compiler).
c_1: ±2% (relative error).

34.3. Valdecoxib solubility data in miscellaneous organic solvents

Components:	**Original Measurements:**
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7] (2) Polyethylene glycol 400 (PEG 400)	[209]C. Liu, K. G. H. Desai, X. Chen, and X. Tang, J. Chem. Eng. Data **50**, 1736 (2005).
Variables:	**Prepared by:**
Temperature	W. E. Acree, Jr.

Experimental Values

T/K	c_1[a]
298.15	0.00679
303.15	0.00950
308.15	0.01418

[a]c_1: molar solubility of the solute in units of mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Constant-temperature bath, analytical balance, and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap tubes and allowed to equilibrate in a constant-temperature shaker bath for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.22 μm membrane filter, and diluted for spectroscopic analysis at 201 nm.

Source and Purity of Chemicals:
(1) 99.6%, Cipla Ltd., Mumbai, India, no purification details were given in the paper.
(2) Purity not given, Showa Chemical Company, Tokyo, Japan, no purification details were given in the paper.

Estimated Error:
Temperature: ±0.1 K.
c_1: ±2.5% (relative error, estimated by compiler).

Components:	Original Measurements:
(1) 4-(5-Methyl-3-phenylisoxazol-4-yl)benzenesulfonamide (Valdecoxib); $C_{16}H_{14}N_2O_3S$; [181695-72-7]	[210]P. Chaudhar, P. Sharma, N. Barhate, P. Kulkarni, and C. Mistry, Curr. Sci. **92**, 1586 (2007).
(2) Polyethylene glycol 400 (PEG 400)	
Variables:	**Prepared by:**
T/K = 298	W. E. Acree, Jr.

Experimental Values

The measured solubility was reported to be $c_1 = 0.117$ mol dm^{-3}.

Auxiliary Information

Method/Apparatus/Procedure:
Mechanical shaker and an UV/visible spectrophotometer.
Excess solute and solvent were placed in closed-cap test tubes and allowed to equilibrate with shaking for 24 h. An aliquot of the saturated solution was removed, filtered through a 0.45 μm membrane filter, and diluted with ethanol for spectroscopic analysis at 246.5 nm.

Source and Purity of Chemicals:
(1) Purity not given, Alembic Ltd., Baroda, India, no purification details were given in the paper.
(2) Purity not given, Qualigen Chemical Company, India, no purification details were given.

Estimated Error:
Temperature: ±2 K (estimated by compiler).
c_1: ±1% (relative error).

35. References

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