Heats of Mixing of Alcohol Solutions. By I. Brown and W. Fock

The density values of some pure components, with densities below $1 \cdot 0$, given in the above three papers are low. In Table 1 of the first two papers the density (d_4^{25}) of benzene was given as $0 \cdot 87359$ and $0 \cdot 087366$ respectively ; these should be $0 \cdot 87366$. In Table 1 of the third paper the following corrections apply :

Benzene : *For* $0 \cdot 87359$ *read* $0 \cdot 87364$.

Acetone : *For* $0 \cdot 78494$ *read* $0 \cdot 78501$.

2,2,4-Trimethylpentane : *For* $0 \cdot 68766$ *read* $0 \cdot 68778$.

These errors were brought about by the use of a table of buoyancy corrections given by Roeder (1953). His method greatly simplified the calculation of the corrections. Unfortunately, the values of the corrections given in Table 1 of his paper apply only to densities from $1 \cdot 00$ to $1 \cdot 50$ and not also to densities below $1 \cdot 0$ as he states.

The values given in his table were calculated from his expression $d = P'/V + K$, where d is the corrected density, P' is the difference in weights of the full and empty pyknometer, and V is the true volume of the pyknometer in ml.   The correction factor K is given by

$$K = \lambda\left(1 - \frac{P'}{V} \cdot \frac{1}{\sigma}\right),$$

where λ is the air density, assumed to be the same at the two weighings, and σ is the density of the weights ($8 \cdot 4$ for the tabulated values given).

Densities calculated by these formulae are correct to 3 in the fifth decimal place provided the air density at the two weighings does not differ by more than $0 \cdot 000005$.

A correct set of K values for densities less than $1 \cdot 00$ can be calculated from the formula. As an example, for an air density of $0 \cdot 00120$ the correction for a P'/V of $1 \cdot 50$ would be $0 \cdot 00099$, while that for a P'/V of $0 \cdot 50$ would be $0 \cdot 00113$ and not $0 \cdot 00099$ as given in Roeder's table.

To confirm the density of highly purified benzene two separate samples were prepared by the method of Brown and Ewald (1951) with an additional fractional distillation before crystallization. The freezing curve of these samples was measured in an apparatus the same as that of Herington and Handley (1950) using a calibrated platinum resistance thermometer and a calibrated Mueller bridge. The purity of the benzene was determined by the method of Mair, Glasgow, and Rossini (1941). The densities were measured by the method of Brown and Ewald (1950) and the refractive indices using a calibrated Hilger-Chance precision refractometer.

Benzene Sample	Purity Mol. (%)	$d_4^{25 \cdot 00}$	$n_D^{25 \cdot 00}$
A	$99 \cdot 98 \pm 0 \cdot 01$	$0 \cdot 87374$	$1 \cdot 49799$
B	$99 \cdot 98$	$0 \cdot 87370$	$1 \cdot 49801$

The accuracy of the thermodynamic data reported in the above papers is unaffected by these density errors as density values were not used for analysis but only as criteria of purity of the components.

References
BROWN, I., and EWALD, A. H. (1950).—*Aust. J. Sci. Res.* A **3** : 306.
BROWN, I., and EWALD, A. H. (1951).—*Aust. J. Sci. Res.* A **4** : 198.
HERINGTON, E. F. G., and HANDLEY, R. (1950).—*J. Chem. Soc.* **1950** : 199.
MAIR, B. J., GLASGOW, A. R., and ROSSINI, F. D. (1941).—*J. Res. Nat. Bur. Stand.* **26** : 591.
ROEDER, G. (1953).—*Chem.-Ing.-Tech.* **25** : 497.