

Erratum: Precise measurement of the $J=2\leftarrow 1$ fine structure interval in N(II) by far-infrared laser magnetic resonance [J. Chem. Phys. 84, 6101 (1986)]

Cite as: J. Chem. Phys. **89**, 5968 (1988); <https://doi.org/10.1063/1.455753>

Published Online: 31 August 1998

A. L. Cooksy, D. C. Hovde and R. J. Saykally



View Online



Export Citation

ARTICLES YOU MAY BE INTERESTED IN

[Erratum: Comments on classical and nonclassical representations of critical demixing in liquid-liquid solutions \[J. Chem. Phys. 87, 6088 \(1987\)\]](#)

The Journal of Chemical Physics **89**, 3931 (1988); <https://doi.org/10.1063/1.455746>

[Erratum: On the critical behavior of circular intensity difference for a nonpolar fluid composed of chiral molecules \[J. Chem. Phys. 88, 1953 \(1988\)\]](#)

The Journal of Chemical Physics **89**, 3930 (1988); <https://doi.org/10.1063/1.455747>

[Erratum: Polarized absorption spectroscopy of \$\Lambda\$ -doublet molecules: Transition moment vs electron density distribution \[J. Chem. Phys. 87, 5589 \(1987\)\]](#)

The Journal of Chemical Physics **89**, 5968 (1988); <https://doi.org/10.1063/1.455754>

Lock-in Amplifiers
up to 600 MHz



Zurich
Instruments



tons is temperature independent because the HCl is fully ionized and (b) the activation energy for proton mobility is near zero; but the binding of the protons by the L defects is expected to add ~ 0.5 eV to the activation energy for proton mobility. However, this energy is similar in magnitude to the formation energy of the L defects so, by Eq. (1), these energies counterbalance one another to give a minimal energy for proton hopping (i.e., above T_c , $[\text{H}_3\text{O}^+] = [\text{H}_3\text{O}^+ \cdot L] / K \cdot [L]$ where $[L]$ is activated by ~ 0.58 eV⁵).

The intrinsic L defects are the majority carriers for temperatures above $T_c^{(b)}$ so the σ_∞ values reflect the mobile intrinsic L -defect concentration. For greater $[\text{HCl}]$ a higher temperature is required for the intrinsic L defects to dominate so, as observed, the transition temperature T_c increases with $[\text{HCl}]$. Also, the change of the slopes of the σ_0 and σ_∞ plots (Fig. 1) must occur at a common temperature, since the proton-hopping activation energy cannot switch from the detrapping value to the high temperature value of ~ 0

until the intrinsic L defects become dominant. Then the concentration of proton traps becomes temperature dependent with an activation energy that roughly cancels the effect of proton binding. An interesting consequence of this model is that ice doped with other strong acids (or with weak acids at very low levels), that effect the Bjerrum defect concentration similarly, should display the same temperature dependence of the conductivities. A case in point may be the behavior of very dilute solutions of HF in ice.⁸

¹(a) I. Takei and N. Maeno, *J. Chem. Phys.* **81**, 6186 (1984); (b) *J. Phys. (Paris)* **48**, C1-121 (1987).

²G. W. Gross, I. C. Hayslip, and R. N. Hoy, *J. Glaciol.* **21**, 143 (1978).

³E. Pines and D. Huppert, *Chem. Phys. Lett.* **116**, 295 (1985).

⁴G. Ritzhaupt and J. P. Devlin, *J. Phys. Chem.* **81**, 521 (1977).

⁵M. Kunst and J. M. Warman, *J. Phys. Chem.* **87**, 4093 (1983).

⁶J. P. Devlin and H. H. Richardson, *J. Chem. Phys.* **81**, 3250 (1984).

⁷P. J. Wooldridge and J. P. Devlin, *J. Chem. Phys.* **88**, 3086 (1988).

⁸G. C. Camplin, J. W. Glen, and J. G. Paren, *J. Glaciol.* **21**, 123 (1978).

ERRATA

Erratum: Precise measurement of the $J=2 \leftarrow 1$ fine structure interval in N(II) by far-infrared laser magnetic resonance [*J. Chem. Phys.* **84**, 6101 (1986)]

A. L. Cooksy, D. C. Hovde, and R. J. Saykally

Department of Chemistry, University of California, Berkeley, California 94720

(1) Equation (3b) should read

$$\langle LSJM_J | T^{(2)}(\mathbf{B}, \mathbf{B}) \cdot T^{(2)}(\mathbf{L}, \mathbf{L}) | LSJM_J \rangle \\ = \frac{-1}{12} \frac{[3M_J^2 - J(J+1)][3X(X+1) - 4J(J+1)L(L+1)]}{(2J-1)J(J+1)(2J+3)} B^2,$$

where $X = S(S+1) - L(L+1) - J(J+1)$.

Correspondingly, footnote 18 is incorrect.

(2) In Table IV, the 2, 3, 1, 2 ¹⁴N(II) transition frequency should read 2459.5576(52).

Erratum: Polarized absorption spectroscopy of Λ -doublet molecules: Transition moment vs electron density distribution [*J. Chem. Phys.* **87**, 5589 (1987)]

Laurence Bigio

G. E. Research and Development Center, Schenectady, New York 12301

Edward R. Grant

Department of Chemistry, Purdue University, W. Lafayette, Indiana 47907

Equation (8b) contains a transcription error omitting a power of two on the factor $(2J+1)$ which appears twice. The correct equation reads

$$I_1 = \sum_{M=-J}^J \frac{W(J, M)}{2} \left\{ \left[\frac{b_J}{8} \left(\frac{(J+M+1)(J-M)(2J+1)^2}{J^2(J+1)^2} \right)^{1/2} \pm \frac{a_J}{8} \left(\frac{(J+M+1)(J-M)(2J-1)(2J+3)}{J^2(J+1)^2} \right)^{1/2} \right]^2 \right. \\ \left. + \left[\frac{b_J}{8} \left(\frac{(J-M+1)(J+M)(2J+1)^2}{J^2(J+1)^2} \right)^{1/2} \pm \frac{a_J}{8} \left(\frac{(J-M+1)(J+M)(2J-1)(2J+3)}{J^2(J+1)^2} \right)^{1/2} \right]^2 \right\}. \quad (8b)$$

Subsequent expressions, graphical results, and conclusions are unaffected, as the correct equation was used in their formulation.

We are grateful to E. W. Rothe and P. Andresen for calling this to our attention.