VIBRATIONAL DEPENDENCE OF HYDROGEN-BROADENED HALFWIDTHS OF WATER VAPOR TRANSITIONS

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The pressure broadened halfwidth of water vapor transitions in the ground, ν_2, ν_1, and ν_3 bands are calculated with hydrogen as the perturbing species using the fully complex Robert and Bonamy theory.[a] [b] The assumed intermolecular potential is a combination of electrostatic, Lennard-Jones 6-12 atom-atom (expanded to 4th order), induction, and dispersion terms. The results are compared with the measurements of Brown and Plymate [c] and the vibrational dependence of the halfwidths investigated.

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[a]D. Robert and J. Bonamy, "Short range force effects in semiclassical molecular line broadening calculations", *J. Phys.* (Paris) **40**,923 (1979).

[b]R. Lynch, R. R. Gamache, and S. P. Neshyba, "Fully Complex Implementation of the Robert-Bonamy Formalism: Halfwidths and Line Shifts of H_2O Broadened by N_2," submitted to *J. Chem. Phys.* November, 1995.

[c]L. R. Brown and C. Plymate, in press, *JQSRT* (1996).