

## DETERMINATION OF THE DIPOLE MOMENT OF H<sub>3</sub>N-SO<sub>3</sub>

MANJULA CANAGARATNA, M.E. OTT, AND K.R. LEOPOLD, *Department of Chemistry, University of Minnesota, 207 Pleasant St., SE, Minneapolis, MN 55455.*

The dipole moment of H<sub>3</sub>N-SO<sub>3</sub> has been determined using pulsed nozzle Fourier transform microwave spectroscopy. The value obtained, 6.204(12) D, is in reasonable agreement with published ab initio estimates <sup>a</sup>. These measurements follow our previously reported <sup>b</sup> structural work on this complex in which the intermolecular N-S bond was shown to be significantly longer in the gas phase than in the solid state. Presumably, the mechanism for the contraction of the N-S bond upon crystallization involves a sharply rising dipole moment function at shorter distances. Thus, the present result is especially interesting in connection with the observed gas-solid structure changes. The complex has also been postulated as a potential seed molecule for the nucleation of atmospheric aerosols, and we comment on possible implications of its phase-dependent structure and bonding on the kinetics and thermodynamics of the nucleation process.

---

<sup>a</sup>M. W. Wong, K. B. Wiberg, and M. J. Frisch, *J. Am. Chem. Soc.* 114, 523 (1992).

<sup>b</sup>M. Canagaratna, J. A. Phillips, H. Goodfriend, and K. R. Leopold, *J. Am. Chem. Soc.*, 118, 5290 (1996).