THE MICROWAVE SPECTRUM AND STRUCTURE OF HNO_3-NH_3

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

We report the microwave spectrum of HNO_3-NH_3 obtained by pulsed nozzle Fourier transform microwave spectroscopy. The complex is the weakly bound precursor to ammonium nitrate, which is an important aerosol in the earth's troposphere. The a-type spectrum has been recorded up to J=3 and the hyperfine structure fully analyzed. The a-type transitions follow a rigid rotor pattern, but the b-type spectra apparently do not. Preliminary analysis of the rotational constants indicates that the nitric acid forms a near- linear hydrogen bond to the ammonia with an intermolecular N–H separation of about 1.8 A. This rather short distance is discussed in the context of incipient proton transfer.