

MILLIMETER-WAVE SPECTROSCOPY OF AMMONIA-WATER WEAKLY BOUNDED COMPLEX^a

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The broadband rotational spectra of ammonia-water (NH₃-H₂O) complex were measured in the frequency range from 50 to 250 GHz using a supersonic-jet emission spectrometer. The NH₃-H₂O complex exhibits two large amplitude motions (LAMs): almost free internal rotation of ammonia owing to very low torsional barrier ($\approx 10 \text{ cm}^{-1}$), and the inversion of water characterized by relatively high barrier ($\approx 700 \text{ cm}^{-1}$). Because of the latter and taking Doppler-limited resolution of spectrometer into account, we could not observe inversion tunneling splittings of *a*-type rotational transitions. In total, about 150 rotational transitions of NH₃-H₂O were assigned in this study. They were fitted together with the data from previous studies^b using the "hybrid" Hamiltonian approach^c. The analysis is in progress as we are currently trying to modify the characteristics of supersonic expansion in order to achieve higher rotational temperatures and consequently to measure higher \tilde{K}_a transitions. The latest results will be presented.

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^bP. A. Stockman, R. E. Bumgarner, S. Suzuki, & G. A. Blake, *J. Chem. Phys.* **96**, 2496 (1992); G. T. Fraser & R.D. Suenram, *J. Chem. Phys.* **96**, 7287 (1992)

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