A MICROWAVE STUDY OF THE HNO_3— $(H_2O)_3$ TETRAMER.

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The gas phase nitric acid tri-hydrate, HNO_3— $(H_2O)_3$, has been observed using microwave spectroscopy. Rotational and nuclear quadrupole constants have been obtained and the identity of the species has been confirmed by isotopic substitution. The results are consistent with a cyclic tetramer with co-planar heavy atoms, and the rotational constants are in good quantitative agreement with those predicted by prior *ab initio* calculations.[a] The a-type spectra show signs of internal motion, likely resulting from large amplitude motion of one or more of the water units. This system represents the third step in the successive hydration of HNO_3, and the experimental and theoretical results will be discussed in the context of incipient ionization of the acid.

[a] P. R. McCurdy, W. P. Hess, and S. S. Xantheas, *J. Phys. Chem. A* **106**, 7628 (2002).