FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF THE TRIFLUOROETHYLENE-HYDROGEN CHLORIDE COMPLEX

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The rotational spectrum of the 1,1,2–trifluoroethylene-hydrogen chloride complex has been observed using Fourier transform microwave spectroscopy. The observed transitions are split by chlorine nuclear quadrupole hyperfine interactions. The rotational and nuclear quadrupole coupling constants determined from the spectra are consistent with a planar structure in which two interactions are observed. The primary interaction is a hydrogen bond with the H atom of HCl serving as the donor and the F atom bonded to C(2) of trifluoroethylene as the acceptor. This hydrogen bond deviates from linearity to allow a secondary interaction between the Cl atom of HCl and the H atom of trifluoroethylene, which is also bonded to C(2). The structure is similar to those of trifluoroethylene-HF[a] and trifluoroethylene-HCCH[b] and a comparison among them will be presented.

[a] H. O. Leung and M. D. Marshall, J. Chem. Phys. 126, 114310 (2007).

[b] H. O. Leung, M. D. Marshall, W. T. Cashion, and V. L. Chen, J. Chem. Phys. 128, 064315 (2008).