FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF THE *TRANS*-1,2-DIFLUOROETHYLENE-HYDROGEN FLUORIDE COMPLEX

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Previous studies of fluoroethylene-protic acid complexes suggest that the structure of *trans*-1,2-difluoroethylene–HF will result from the interplay of two interactions. These are a primary hydrogen bond with HF serving as the donor and an F atom acceptor on the difluoroethylene subunit, and a secondary interaction, made possible by a deviation of the hydrogen bond from linearity, between the F atom of HF and a difluoroethylene H atom. Two sites are available for the secondary interaction in complexes of *trans*-1,2-difluoroethylene: either through the H atom located *cis* to or geminal to the hydrogen bonded F atom. *Ab initio* calculations at the MP2/6-311++G(2d,2p) level indicate that the former structure is more stable. Indeed, the rotational spectrum of the complex, collected using Fourier transform microwave spectroscopy, is consistent with this geometry in which the two interactions involve atoms bonded to different carbon atoms in the difluoroethylene subunit.