

MICROWAVE SPECTRUM AND STRUCTURE OF HBr-SO₃ AND THE QUADRUPOLE COUPLING CONSTANT OF Ar-³³SO₃

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We report the microwave spectrum and structure of HBr-SO₃ as determined by pulsed nozzle Fourier transform microwave spectroscopy. Like its previously studied HF and HCl analogs, the complex exhibits a symmetric top spectrum and has a structure in which the halogen approaches the sulfur along the C₃ axis of the SO₃. The S-Br distance is 3.24 Å and the HBr subunit forms an angle of approximately 73 deg. (or 107 deg.) with the a-axis of the complex. The structures of the three HX-SO₃ complexes are compared. We also report a measurement of the ³³S nuclear quadrupole coupling constant in Ar-³³SO₃. The value obtained (-15.296(14) MHz) is compared with a recent theoretical calculation of the monomer value and discussed in terms of the angular oscillations of the SO₃ unit.