SPECTROSCOPY OF BROMINE DIOXIDE, OBrO

Holger S. P. Müller, Charles E. Miller, and Edward A. Cohen, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109.*

The rotational spectra of $O^{79}BrO$ and $O^{81}BrO$ have been studied for the first time in selected regions between 88 and 627 GHz in the (000), (010), and (020) states. OBrO is a rather asymmetric prolate rotor (κ = -0.824) with a large dipole moment and a bending mode of *ca.* 310 cm^{-1}. This results in a rich spectrum, permitting a large range of J's (1 - 61) and K_a's (0 - 14) to be observed. The splittings caused by the electronic and nuclear spins are substantially larger than those of the related OClO. Rotational, centrifugal distortion, electron and nuclear spin-rotation, spin-spin, and nuclear quadrupole coupling constants have been determined. Centrifugal distortion terms for the ϵ's and some of the hyperfine constants have also been determined. The molecular structure and the harmonic force constants have been derived. Results from gas phase infrared and visible spectroscopy will be presented briefly.