THE ROTATIONAL SPECTRUM OF IODINE DIOXIDE, OIO

CHARLES E. MILLER, *Department of Chemistry, Haverford College, Haverford, PA 19041-1392*; and EDWARD A. COHEN, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109-8099*.

The rotational spectra of OIO in its ground vibrational and first excited bending states have been observed for the first time. OIO was formed initially from the products of a microwave discharge in O_2 passing over molecular iodine and later with greater yield in a DC discharge through a mixture of O_2 and I_2 vapor. OIO is an asymmetric prolate rotor (κ = -0.690) with a $^2B_1$ electronic ground state. Over 550 ground state transitions and over 160 transitions of the excited bending state have been included in the fits. The resulting parameters are well determined and will be compared to those recently published for OBrO and OClO. These will be interpreted in terms of the molecular geometry, harmonic force field, and electronic structure.