THE ROTATIONAL SPECTROSCOPY OF FOUR ANTIMONY CONTAINING DIATOMIC MOLECULES: SbN, SbP, SbF and SbCl

S. A. COOKE, and M. C. L. GERRY, *Department of Chemistry, The University of British Columbia, 2036 Main Mall, Vancouver, British Columbia, Canada, V6T 1Z1*.

In separate experiments the molecules SbN, SbP, SbF and SbCl have been prepared by laser ablating antimony metal in the presence of NH_3, PH_3, SF_6 or Cl_2, respectively. Their pure rotational spectra have been measured with a cavity pulsed jet Fourier transform microwave spectrometer. Hyperfine structure in the rotational spectra of these molecules has led to the determination of the ^{121}Sb and ^{123}Sb nuclear quadrupole coupling constants in all four molecules for the first time. This in turn has enabled the electronic structures of the Sb-pnictides and Sb-halides to be compared and contrasted. The measurement of the respective rotational constants has provided highly precise internuclear distances.