

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

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In separate experiments the molecules SbN, SbP, SbF and SbCl have been prepared by laser ablating antimony metal in the presence of NH<sub>3</sub>, PH<sub>3</sub>, SF<sub>6</sub> or Cl<sub>2</sub>, 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 <sup>121</sup>Sb and <sup>123</sup>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.