THE PURE ROTATIONAL SPECTRUM OF INDIUM ISOCYANIDE

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The pure rotational spectrum of indium isocyanide has been measured by cavity Fourier transform microwave (FTMW) spectroscopy. To our knowledge, there have been no previous spectroscopic measurements of this molecule. The gas-phase samples were prepared using a laser ablation source which is mounted into one of the spectrometer cavity mirrors. The ablated indium metal was reacted with cyanogen in the gas phase to produce InNC. Rotational transitions for several isotopomers of InNC have been measured in the frequency range 4 to 26.5 GHz. The observed lines are consistent with the molecule having a linear isocyanide structure. Detailed structural parameters derived from the rotational constants will be presented. Hyperfine structure due to $^{115}$In and $^{14}$N nuclei has been observed and nuclear quadrupole and nuclear spin-rotation coupling constants have been determined. These constants will be used to compare the bonding in InNC with that of similar linear metal isocyanide and indium monohalide species.