

ZEKE-PFI SPECTROSCOPY AND THEORETICAL CALCULATIONS OF THE InNH_3 COMPLEX

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InNH_3 was prepared with pulsed laser vaporization of an indium rod and subsequent reactions with ammonia seeded in helium gas. The complex was identified with laser ionization time-of-flight mass spectrometry and studied with single-photon ZEKE-PFI (zero kinetic energy pulsed field ionization) spectroscopy. The ZEKE-PFI spectrum shows two progressions in the $39400\text{-}40800\text{ cm}^{-1}$ regions with the bandwidth of 5 cm^{-1} . From the spectral measurements, we have obtained the ionization potential (39689 cm^{-1}) and the In-NH_3 stretching frequencies ($\nu_3^+ = 230\text{ cm}^{-1}$ and $\nu_3 = 140\text{ cm}^{-1}$) of the complex. In addition to the experimental work, we have used density functional and *ab initio* methods to calculate the geometries, vibrational frequencies, and electronic energies of the ground states of the neutral and ionic complexes. The theoretical results will be discussed in the comparison with the experimental observations.