ZEKE SPECTROSCOPY OF ALUMINUM AND GALLIUM COMPLEXES OF PIPERIDINE

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The Al and Ga complexes were produced by reactions of laser-vaporized metal atoms with piperidine ($C_5H_{11}N$) and characterized by pulsed field ionization-zero electron kinetic energy (PFI-ZEKE) spectroscopy. For Al-$C_5H_{11}N$, the adiabatic ionization potential was measured to be 37060 cm^{-1}, and vibrational frequencies were determined for the Al^+-N stretching (238 cm^{-1}), Al^+/Al-N-C bending (84/105 cm^{-1}) and piperidine-based vibrations (300 and 464 cm^{-1}). By comparing the ZEKE measurements with *ab initio* calculations, the neutral and ionic aluminum complexes were determined to be in C_s symmetry with Al binding to the nitrogen of the chair-like piperidine ring. For the gallium complex, the ZEKE spectrum shows an ionization potential of 37529 cm^{-1}, a Ga^+-N stretching frequency of 176 $\mathrm{cm}^{-1}$and a Ga^+-N-C bending frequency of 70 cm^{-1}.