# ZERO ELECTRON KINETIC ENERGY SPECTRA OF $GaNH_3$ AND $GaNH_2(CH_3)$

SHENGGANG LI, GRETCHEN K. ROTHSCHOPF, DINESH PILLAI, BEN WILSON, BRAD SOHNLEIN AND DONG-SHENG YANG, *Department of Chemistry, University of Kentucky, Lexington, KY 40506-0055*.

Zero electron kinetic energy (ZEKE) spectra were obtained for the $GaNH_3$ and $GaNH_2(CH_3)$ complexes. Ab initio and Franck-Condon factor calculations were performed to help spectral assignments. $GaNH_3$ has a $^1A_1$ ($C_{3v}$) ground state in the ion and a $^2$A'($C_s$) ground state in the neutral. The ionization potential of the $^2$A'($C_s$) state is 40136 (5) $cm^{-1}$. Metal-ligand stretching frequencies are 270 $cm^{-1}$ in the $^1A_1$ state and 161 $cm^{-1}$ in the $^2$A' state. The spectrum of $GaNH_2(CH_3)$ displays more vibronic transitions but at lower energies than $GaNH_3$. The ionization potential of $GaNH_2(CH_3)$ is 39331(5) $cm^{-1}$. The $Ga^+$-N stretching in this case has a frequency of 299 $cm^{-1}$ in the ion. The $Ga^+$-N-C and Ga-N-C bending vibrations have frequencies of 126 and 94 $cm^{-1}$, respectively.