ZEKE SPECTROSCOPY OF GALLIUM-METHYLAMINE COMPLEXES: Ga-$NH_n(CH_3)_{3-n}$ (n = 0-2)

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Gallium-amine complexes were produced by reactions of gallium atoms and methylamines seeded in helium or argon carrier gases. The Ga-$NH_n(CH_3)_{3-n}$ complexes have adiabatic ionization potentials of 39330, 38790, and 38081 cm^{-1} for n = 2, 1, and 0, respectively. The ZEKE spectrum of Ga-NH_2CH_3 exhibits 299 and 124 cm^{-1} vibrations in the ionic state and a 93 cm^{-1} vibration in the neutral state. In the case of Ga-$NH(CH_3)_2$, 864, 331, 206, and 132 cm^{-1} vibrations were measured for the ion, and 177 and 128 cm^{-1} vibrations for the neutral molecule. For Ga-$N(CH_3)_3$, the spectrum displays ionic vibrations of 785, 462, 188, and 111 cm^{-1} and a neutral vibration of 133 cm^{-1}. Assignments of the observed vibrations will be discussed in comparison with theoretical calculations.