Vibrationally resolved spectra of the aluminum-phosphine and -arsine complexes were measured using ZEKE spectroscopy. The ZEKE spectrum of Al-P(CH₃)₃ reveals the vibrational energy levels of low-frequency modes in the cationic and neutral species. These modes include the symmetric Al⁺-P stretching (326 cm⁻¹) and Al⁺-P-C bending (76 cm⁻¹) in the ion and the symmetric Al-P-C bending (71 cm⁻¹) in the neutral. The spectrum of Al-As(CH₃)₃ displays a major progression associated with the Al⁺-As-C bending. Other transitions are also evident in the spectrum. Analysis is ongoing.