VIBRATIONAL AUTODETACHMENT: INTRAMOLECULAR VIBRATIONAL RELAXATION TO ELECTRONIC MOTION

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If a negative ion has vibrational energy in excess of the binding energy of its most weakly bound electron, the anion can undergo vibrational autodetachment (VAD), similar to thermionic emission. When VAD occurs after targeted infrared excitation of a specific vibrational mode in the anion, it encodes information on the intramolecular vibrational relaxation (IVR) processes that take place between excitation and electron emission. Analyzing the kinetic energy distribution of electrons emitted in VAD processes, can yield some information on the IVR process. The photoelectron spectra can be modeled, and we will present an analysis of vibrational autodetachment photoelectron spectra after excitation of CH stretching modes as a case study.