PHOTOELECTRON IMAGING OF NITROETHANE, NITROPROPANE AND NITROBUTANE

CHRISTOPHER L. ADAMS, BENJAMIN J. KNURR and J. MATHIAS WEBER, *JILA, NIST and Department of Chemistry and Biochemistry, University of Colorado, Boulder, CO 80309*.

We will show high resolution, low-energy photoelectron imaging data on nitroethane, nitropropane, 2-nitropropane and nitrobutane. We obtain new values for the adiabatic electron affinities of these nitroalkanes by comparison of the spectra of bare anions with the spectra of Ar solvated anions, where hot bands are strongly suppressed. For nitroethane, we can quantitatively recover the photoelectron spectrum using Franck-Condon calculations and find an adiabatic electron affinity of (192 ± 6) meV. Similar to the case of nitromethane, the main contributions to the Franck-Condon profile come from the vibrational modes involving the nitro group. For nitropropane and nitrobutane, electron affinities are tentatively 223 meV and 238 meV, respectively.