

USING HIGH-RESOLUTION PHOTOELECTRON IMAGING TO PROBE THE SPECTROSCOPY OF CRYOGENICALLY COOLED AZOLIDE MOLECULES

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Photoelectron spectroscopy is a powerful technique to investigate the electronic structure and chemical bonding of anions and the corresponding neutrals upon electron detachment. Here, we use our electrospray ionization photoelectron spectroscopy apparatus, which couples a cryogenically-cooled 3D Paul trap and a high resolution imaging system to get the vibrational and electronic information about three azolide: pyrazolide, pyrrolide and imidazolide. Besides the expected conventional dipole bound state, a core-excited dipole bound state is observed in pyrazolide with the neutral core in its first excited electronic state. And a completely different threshold behavior is observed for pyrrolide and imidazolide with a similar pi type HOMO: a d-wave-dominated spectrum is found for pyrrolide and an s-wave-dominated spectrum is found for imidazolide.