PHOTOELECTRON IMAGING OF OXIDE.VOC CLUSTERS

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Perturbations of the bare O2- and O4- electronic structure arising from VOC (VOC = hexane, isoprene, benzene and benzene.D6) interactions are investigated using anion photoelectron imaging at 2.33 and 3.49 eV photon energies. Trends observed from comparing features in the spectra include VOC-identity-dependent electron affinities of the VOC complexes relative to the bare oxide clusters, due to enhance stability in the anion complex relative to the neutral. Autodetachment is observed in all O4-.VOC spectra and only isoprene with O2-. In addition, the intensities of transitions to states correlated with the singlet states of O2 neutral via detachment from the O2-.VOC anion complexes show dramatic VOC-identity variations. Most notably, benzene as a complex partner significantly enhances these transitions relative to O2- and O2-.hexane. A less significant enhancement is also observed in the O2-.isoprene complex. This enhancement may be due to the presence of low-lying triplet states in the complex partners.