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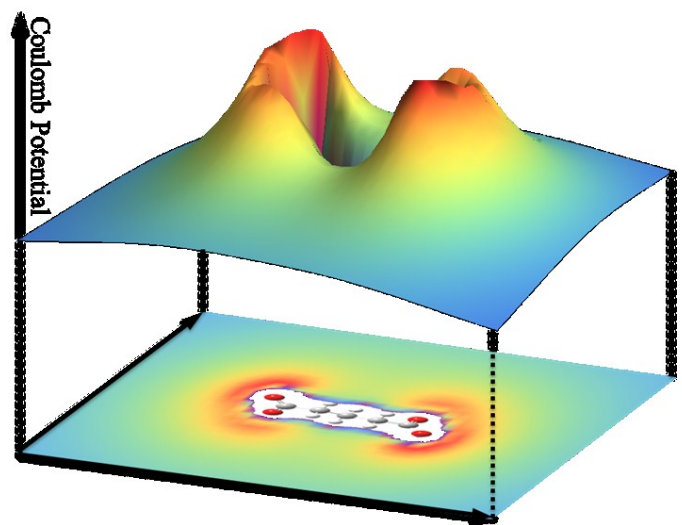
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Femtosecond photoelectron imaging of complex (poly)-anions

Using femtosecond photoelectron imaging we study the dynamics of complex anions, polyanions and biological anions. Two recent examples will be presented:

Several important electron accepting species based on the p-benzoquinone radical anion have been studied. Excited states in these systems primarily relax via internal conversion on a sub-100 fs timescale, through a series of conical intersections to the anion ground state. Even states excited > 1 eV above the detachment threshold favour internal conversion to auto-detachment. This provides an explanation of the exceptional electron accepting abilities of quinones and their choice as nature's favourite electron acceptor.

Polyanions have interesting properties in the gas-phase due to the balance of Coulomb repulsion between excess charges and electron-nuclear attraction, leading to a Repulsive Coulomb Barrier (RCB) to photodetachment. We study the effects of the RCB, such as adiabatic tunneling through it and how it influences the angular distribution of outgoing photoelectrons. Using resonant alignment of polyanions we show that the RCB can be a sensitive probe for molecular dynamics.



Repulsive Coulomb Barrier (RCB) experienced by an electron detached from a dicarboxylic acid dianion