PHOTOFRAGMENTATION DYNAMICS OF $ICN^-(CO_2)_n$

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We report photofragmentation studies of mass-selected $ICN^-(CO_2)_n$ (n=0-18) cluster anions following 400, 500 and 600 nm excitation. Photodissociation of ICN^- following excitation *via* a 500 nm photon results exclusively in an I^- anionic photoproduct. However, excitation at either 400 nm or 600 nm results in 30% CN^- and 70% I^- anionic photoproducts. Complexation of ICN^- with two or more CO_2 molecules opens a third product channel, recombination of the chromophore on the ground state, a channel that is observable at all three photon energies. The product branching ratios for photodissociation of $ICN^-(CO_2)_n$ show sharp contrast to trends previously observed in dihalide studies of $IBr^-(CO_2)_n$ and $I_2^-(CO_2)_n$, but are strikingly similar to results found for $ICl^-(CO_2)_n$. Notably, a peak in the percentage of recombined photoproducts observed as a function of the number of solvent molecules shifts to larger n values as photon energy increases and does not reach 100% in the first solvation shell. It is likely that an intracluster reaction involving formation of the molecule $NCCO_2^-$ plays a significant role in the dynamics observed following excitation of the $ICN^-(CO_2)_n$ anion.
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