A SPECTROSCOPIST'S VIEW OF THE ANIONIC H-BOND

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Argon clusters provide a versatile synthetic medium in which to trap and cool a wide variety of molecular ions, ion-molecule complexes, and reaction intermediates. When several argon atoms are retained in the product ion, vibrational predissociation is available for spectroscopic characterization of the isolated species. We exploit this capability to determine how water and other simple molecules bind to molecular anions. We are particularly interested in understanding how the docking geometry of a water molecule depends on the properties of the anion, and in elucidating the relationship between the bonding geometry and the intramolecular distortion induced in the water molecule. We discuss the evolution from single to double ionic H-bonding when a water molecule is attached to negatively charged, triatomic domains of larger molecules like the acetate ion. We focus the discussion on the role of vibrational adiabaticity in the analysis of the surprisingly complex spectra.