

VIBRATIONAL PREDISSOCIATION SPECTROSCOPY OF THE  $(\text{H}_2\text{O})_n^-$   $n=6-21$  CLUSTERS IN THE OH STRETCHING REGION: EVOLUTION OF THE EXCESS ELECTRON-BINDING SIGNATURE INTO THE INTERMEDIATE CLUSTER SIZE REGIME

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We report vibrational predissociation spectra of the  $(\text{H}_2\text{O})_n^-$  cluster ions in the OH stretching region to determine whether the spectral signature of the electron-binding motif identified in the smaller clusters continues to be important in the intermediate size regime ( $n=7-21$ ). This signature consists of a redshifted doublet that dominates the OH stretching region, and has been traced primarily to the excitation of a single water molecule residing in a double H-bond acceptor (AA) binding site, oriented with both of its H atoms pointing toward the excess electron cloud. Strong absorption near the characteristic AA doublet is found to persist in the spectra of the larger clusters, but the pattern evolves into a broadened triplet around  $n=11$ . A single free OH feature associated with dangling hydrogen atoms on the cluster surface is observed to emerge for  $n=15$ , in sharp contrast to the multiplet pattern of unbonded OH stretches displayed by the  $\text{H}^+(\text{H}_2\text{O})_n$  clusters throughout the  $n=2-29$  range.