

VIBRATIONAL PREDISSOCIATION DYNAMICS OF THE (H₂O)₂ DIMER

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The state-to-state vibrational predissociation dynamics of the (H₂O)₂ dimer were studied by resonance-enhanced multiphoton ionization (REMPI) and velocity-map imaging (VMI) to obtain pair-correlated product energy distributions. The 2+1 REMPI spectra of the H₂O photofragments were recorded via the $\tilde{C}^1B_1(000) \leftarrow \tilde{X}^1A_1(000 \text{ and } 010)$ transition following a vibrational excitation of the dimers bound-OH stretch fundamental. The fragment center-of-mass translational energy (c.m. E_T) distributions were determined from VMI of selected rotational states of the detected H₂O photofragments. The c.m. E_T distributions were then converted to pair-correlated H₂O cofragment rotational level distributions. This is the first experiment in which H₂O products with bend (ν_2) excitation were observed by REMPI. The dissociation energy of the dimer was determined from the images with spectroscopic accuracy. The predissociation mechanism of (H₂O)₂ will be discussed and compared with the corresponding hydrogen bonded dimers of an acid (HCl-H₂O) and a base (NH₃-H₂O).