VIBRATIONAL PREDISSOCIATION DYNAMICS OF THE $(H_2O)_2$ DIMER

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The state-to-state vibrational predissociation dynamics of the $(H_2O)_2$ 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 H_2O photofragments were recorded via the $\tilde{C}^1B_1$ (000) $\leftarrow$ $\tilde{X}^1A_1$ (000 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 H_2O photofragments. The c.m. E_T distributions were then converted to pair-correlated H_2O cofragment rotational level distributions. This is the first experiment in which H_2O 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 $(H_2O)_2$ will be discussed and compared with the corresponding hydrogen bonded dimers of an acid (HCl-H_2O) and a base (NH_3-H_2O).