METHYL ROTOR INDUCED IVR IN 2-PYRIDONE MEDIATED BY A DOUBLE HYDROGEN-BONDED CYCLIC INTERFACE

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Over the past three decades, many experimental and theoretical investigations have demonstrated that intramolecular vibrational energy redistribution (IVR) in an aromatic chromophore can be accelerated on substitution by a methyl group. In those studies the methyl group is attached directly to an aromatic site. In the present study, by measuring the laser-induced fluorescence spectra of 1:1 hydrogen-bonded mixed dimers of 2-pyridone (PY) with formic (FA), acetic (AA) and propanoic (PA) acids we demonstrate that the threshold of the excited state IVR is lowest in the case of PY…AA mixed dimer. We interpret the observation as due to coupling of the rotor mode of AA with the ring modes of 2-pyridone moiety mediated by the hydrogen bond modes of the cyclic dimeric interface. In the talk, the mechanism of such coupling will be discussed.