

PHOTOIONIZATION INDUCED INTERMOLECULAR PROTON TRANSFER IN THE CH...O HYDROGEN BONDED CYCLOPENTANONE DIMER IN THE GAS PHASE

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Although α -cleavage is the preferred reaction channel upon photoionization of small carbonyl compounds, we present experimental and theoretical evidences that in a jet-cooled CH...O hydrogen bonded dimeric complex, enolization and intermolecular proton transfer turns out to be one of the prominent channels of cyclopentanone when photoionized at the threshold by a two-photon ionization scheme. On changing the ionization wavelength of the nanosecond laser pulses, we show that the fragmentation channels of dimer as well as monomer are immensely altered for photoionizations by the 2nd (532 nm), 3rd (355 nm) and 4th (266 nm) harmonics of a Nd: YAG laser. The observed changes are interpreted with the energetic predictions of electronic structure calculations.