ELECTRONIC SPECTROSCOPY OF TWO N-PHENYL CIS AMIDES AND THEIR HYDROGEN BONDED CLUSTERS WITH WATER AND AMMONIA

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Electronic spectra of two N-phenyl amides in which the amide group is constrained to a cis configuration by incorporation into a five- or six-membered rings as well as their clusters with water and ammonia have been obtained in a supersonic jet expansion using mass resolved resonant two photon ionization spectroscopy (R2PI). Based on both spectral shifts of the electronic origin transitions and the results of statistical deuteration experiments, the single water clusters are assigned to a cyclic structure where water interacts strongly with both the NH and CO sites of the amide. The single ammonia complexes are also found to adopt cyclic, doubly hydrogen bonded structures that, in contrast, contain strong NH–N and weak NH–O hydrogen bonds. Complexes containing up to two ammonia molecules and up to three water molecules have also been assigned to cyclic structures containing hydrogen bonds at both sites of the amide group. In addition, R2PI spectra of the ternary mixed clusters containing both a water and an ammonia molecule have been recorded.