CONFORMATION-SPECIFIC ELECTRONIC AND VIBRATIONAL SPECTROSCOPY OF JET-COOLED *O*-(ACETAMIDOETHYL)-*N*-ACETYLTYRAMINE

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Following our investigations of *N*-acetyl-tryptophan-methyl-amide (NATMA), a dipeptide, and other flexible biomolecules, we have investigated *O*-(acetamidoethyl)-*N*-acetyltyramine (OANAT). OANAT has two flexible peptide mimetic side chains, ($OCH_2CH_2NHC(O)CH_3$) and ($CH_2CH_2NHC(O)CH_3$), substituted *para* on a benzene chromophore. These side chains are designed to explore the spectroscopy and dynamics of conformational isomerization in a molecule with two largely decoupled branches to the potential energy surface. Results from one color and two color resonant two photon ionization (R2PI), laser induced fluorescence (LIF), UV-UV hole-burning, and resonant ion dip infrared (RIDIR) spectroscopies will be presented. The electronic spectrum is highly congested and thus far can be accounted for by six conformations according to R2PI UV-UV hole-burning spectroscopy. The electronic origins of these six conformers are split into a closely spaced pair (3 cm^{-1} separation) near 34538 cm^{-1}, and a set of four shifted over 1000 cm^{-1} to the blue. The set of four is further divided into a closely spaced pair and two remaining origins due to single conformations. To aid in the analysis, analogous results from the single-side chain molecules have been obtained. When combined with computed structures and vibrational frequencies, tentative assignments are made for the conformations observed. These assignments will be discussed.