INFRARED SPECTROSCOPY OF PROTONATED CARBONYLS: PROTONATED GLYOXAL

J. D. MOSLEY, T. C. CHENG, and M. A. DUNCAN, *University of Georgia, Dept. of Chemistry, 1001 Cedar St, Athens, GA 30602*.

The protonation site of carbonyls is usually at oxygen, allowing studies of the $O-H^+$ and carbonyl stretch vibrations and their variation with the local chemical environment. We have already studied protonated acetone and its proton-bridged dimer and now extend the study of protonated carbonyls to protonated glyoxal. Glyoxal is the simplest α-oxoaldehyde, which has the chance to form an intramolecular bridging proton structure upon protonation. Computational chemistry predicts the proton-bridged *cis* isomer to be the lowest energy structure. The infrared spectrum of mass-selected protonated glyoxal is obtained using infrared photodissociation spectroscopy with Ar tagging. The spectrum shows the presence of only the higher energy *trans* isomer when compared with purely harmonic calculations. The frequencies of the $O-H^+$ and carbonyl stretch vibrations of protonated glyoxal are compared to other protonated carbonyls.