SPECTROSCOPIC INVESTIGATION OF ELECTRON-INDUCED PROTON TRANSFER IN THE FORMIC ACID DIMER, $(HCOOH)_2$

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We have isolated the stable form of the formic acid dimer anion $(HCOOH)_2^-$, a model for electron-induced proton transfer between nucleic acid base-pairs, in the gas phase. The vibrational signatures of this species and its various isotopomers were investigated using Ar predissociation and photodetachment spectroscopies in the 600-3800 cm^{-1} range. We relate the experimental infrared transitions of the anion to those predicted for its calculated lowest energy structure in order to determine if a proton transfer event does in fact occur upon excess electron attachment to this simple hydrogen-bonded dimer. Additionally, we determined its vertical detachment energy (VDE), 1.8 eV, using velocity-map photoelectron imaging.