

Abstract Submitted  
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**New Photoelectron/Photoion Spectrometer: New Look at the Adiabatic Ionization Potential of Acetic Acid** PIOTR W. FORYSINSKI, PHILIPP ZIELKE, DAVID LUCKHAUS, RUTH SIGNORELL, University of British Columbia — We report the setup of a new photoion/photoelectron spectrometer for the investigation of the interaction of extreme ultraviolet (EUV) light (wavelength  $\geq 70\text{nm}$ ) with molecules, clusters and aerosol particles. We perform pulsed field ionization zero kinetic energy electron (PFI-ZEKE) spectroscopic studies of the acetic acid monomer (AA) as a stepping stone on the way to larger systems. We measure the adiabatic ionization potential of AA at higher resolution than previously reported, ending a 40 year debate regarding its true position. The newly established value for the ionization potential is thus  $85912 \pm 5 \text{ cm}^{-1}$ . We resolve torsional hot bands adjacent to the 0 - 0 transition, explaining the shift in previously reported values. These hot band frequencies allow us to calculate the torsional barrier in the cation, which is nearly double of that in the ground state. The value of  $316 \pm 10 \text{ cm}^{-1}$  for the torsional barrier suggests a significant shortening of the C-C bond in the molecular cation. Furthermore, we also observe the CCO deformation mode of the cation at  $357 \pm 5 \text{ cm}^{-1}$  above the adiabatic ionization potential.

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