

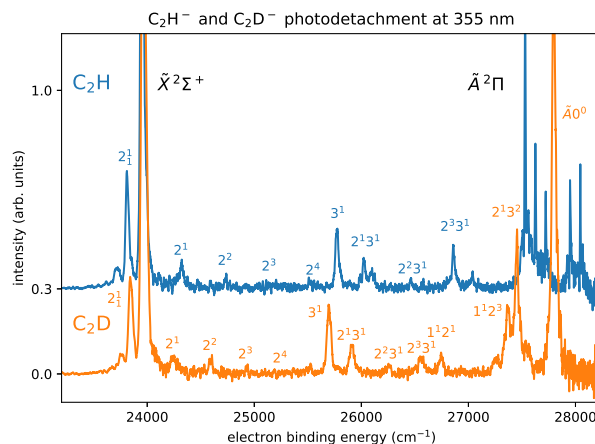
DECOMPOSITION OF VIBRONIC AND RENNER-TELLER STRUCTURE IN C₂H AND C₂D FROM ANION HIGH-RESOLUTION PHOTOELECTRON IMAGING

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The ethynyl radical, C₂H, has a complex spectral structure due to vibronic coupling between the ground $\tilde{X}^2\Sigma^+$ and low-lying $\tilde{A}^2\Pi$ electronic states, and a Renner-Teller interaction within the Π state.

A good understanding of the low-lying rovibrational structure has come from measurements, including slow electron velocity-map imaging of anion photoelectron spectra^a, and *ab initio* calculations^b, that give wavefunction character.

In this work, high-resolution photoelectron velocity-map imaging of C₂H⁻ and C₂D⁻ photodetachment (the 355 nm wavelength illustrated), provide a quantitative comparison over an extended energy range, to reveal unassigned structure, anomalous intensities, and illustrate the dramatic difference between isotopologues in the region of the *A*-state. These measurements, together with the measured photoelectron angular distributions, provide new insight into the non-adiabatic couplings of ethynyl.



^aJ. Zhou *et al.* *J. Chem. Phys.* **127**, 114313 (2007).

^bR. Tarroni and S. Carter, *J. Chem. Phys.* **119**, 12878 (2003).

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