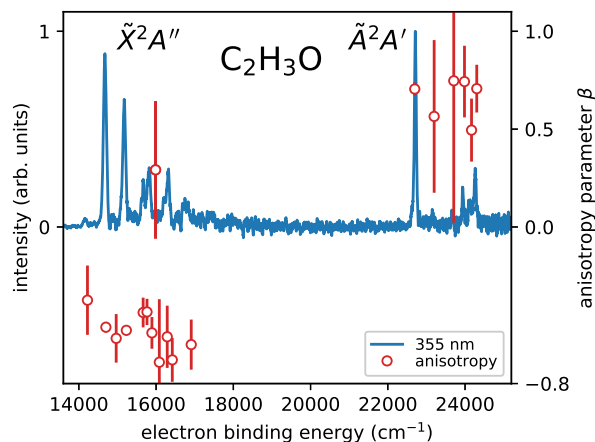


AUTODETACHMENT AND VIBRONIC COUPLED PHOTODETACHMENT TRANSITIONS OF  $C_2H_3O^-$ 

STEPHEN T GIBSON, BENJAMIN A LAWS, *Research School of Physics and Engineering, Australian National University, Canberra, ACT, Australia.*

The photoelectron spectrum of the vinoxy anion  $C_2H_3O^-$  is studied using velocity-imaging, with the angular distributions providing electronic-state and vibrational-mode specific characterization. A 355 nm photoelectron spectrum, together with anisotropy parameters determined for some of the stronger transitions is shown in the figure. Photodetachment at longer wavelengths have also been measured.

The spectroscopic analysis builds on a previous SEVI<sup>a</sup> study, and a CRDS<sup>b</sup> work. Forbidden asymmetric vibrational modes may gain intensity through vibronic coupling between the neutral ground state and an excited state, of the correct symmetry, and have an anomalous anisotropy parameter. The positive  $\tilde{X}$  transition is  $9_0^2 11_1^1$ . In addition, the vinoxy anion has dipole-bound excited electronic states, that produce very narrow transitions. For  $C_2H_3O^-$  there is evidence of autodetachment from dipole-bound states of the anion, and vibronic coupling of the neutral ground state.



<sup>a</sup>Slow-Electron-Velocity-map-Imaging: Yacovitch *et al.* *J Chem Phys* **130** 244309 (2009) doi:10.1063/1.3157208

<sup>b</sup>Cavity-Ring-Down-Spectroscopy: Thomas *et al.* *J Chem Phys* **132** 114302 (2010) doi:10.1063/1.3352976

Research supported by the Australian Research Council Discovery Project Grant DP160102585.