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Relaxation Dynamics of the Solvated Electron in Water, Methanol and Ethanol MADELINE H. ELKINS, HOLLY L. WILLIAMS, DANIEL M. NEUMARK, University of California, Berkeley — The solvated electron, an isolated electron in solution, is of fundamental interest to the study of solvation. Lacking nuclear degrees of freedom, this highly reactive transient can act as a simple probe of solute-solvent interaction and condensed phase, non-adiabatic dynamics. We present time resolved photoelectron spectra of solvated electrons in water, methanol and ethanol microjets. Unlike prior results from transient absorption (TA) experiments in bulk[1] or extrapolated from time resolved photoelectron spectroscopy (TRPES) of cluster anions[2], our technique allows for state specific assignment of the individual features without relying on extrapolation methods. In water, our results reproduce the relaxation timescales found in the TA experiments and provide convincing support of the so called "non-adiabatic" mechanism. These results suggest that both binding energies and relaxation dynamics can be extrapolated from water cluster anion experiments; however, results in methanol and ethanol provide a qualitative agreement with TA experiments but a more complex story with regard to anionic cluster TRPES.

[1]K. Yokoyamma et al., J. Phys. Chem. A, **102**, 6957 (1998)
[2]A. Bragg et al. Science, **306**, 669 (2004)

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