Inelastic scattering effects in photoemission from solvated electrons in bulk water, methanol, and ethanol

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Supporting Information

S-I Electron kinetic energy distribution for solvated electrons measured as a function of $h\nu_{probe}$

Figures S1 and S2 show one-photon photoemission spectra of solvated electrons measured at 11 different probe photon energies ($h\nu_{probe}$) in methanol and ethanol, respectively; the intensity of each distribution is normalized at its peak. The peak position and full width at half maximum (FWHM) of the electron kinetic energy distributions (eKEDs) at each probe photon energy are summarized in Table S1, S2, and S3 respectively for solvated electrons in water, methanol, and ethanol. The measured streaming potentials are also given.

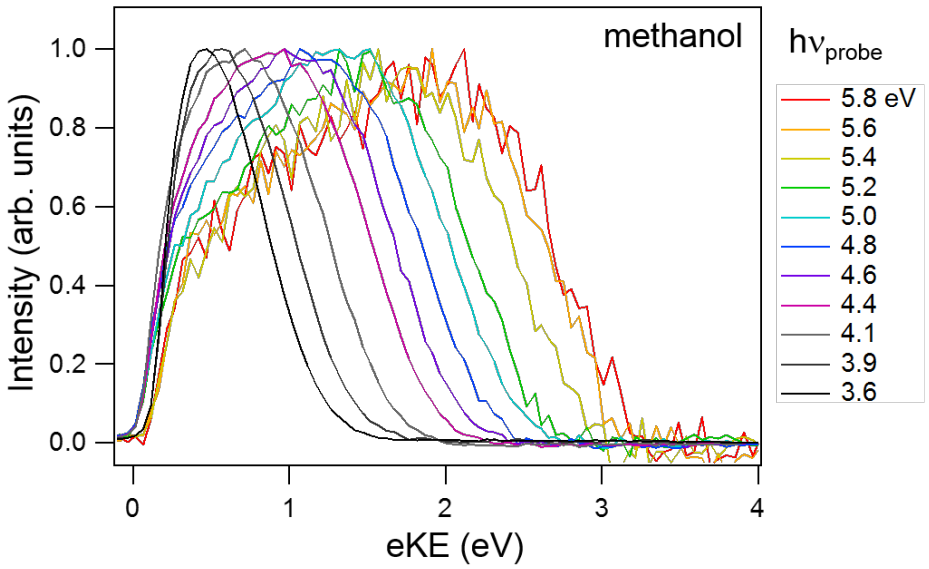

Figure S1. Electron kinetic energy distributions corresponding to ultraviolet one-photon photoemission from solvated electrons in methanol produced by CTTS from I^- in NaI solution. The pump-probe time delay was 600 ps.

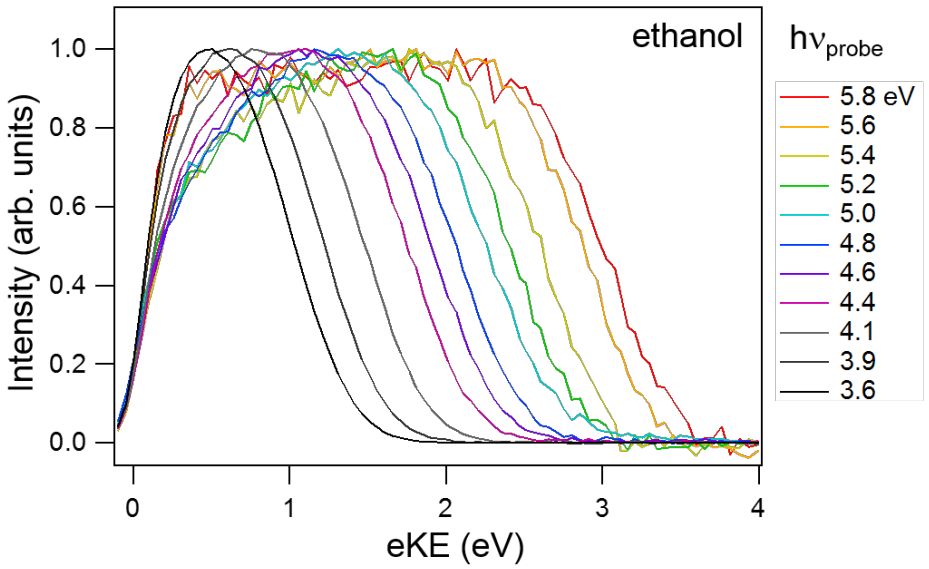

Figure S2. Electron kinetic energy distributions corresponding to ultraviolet one-photon photoemission from solvated electrons in ethanol produced by CTTS from I^- in NaI solution. The pump-probe time delay was 600 ps.

Table S1. The peak position and FWHM of electron kinetic energy distributions measured for hydrated electrons at various $h\nu_{probe}$. The streaming potential (SP) is also given.

$h\nu_{probe}$ (eV)	Peak (eV)	FWHM (eV)	SP (V)
5.8	1.3	2.0	-0.2
5.6	1.4	1.9	
5.4	1.5	1.7	
5.2	1.1	1.5	
5.0	1.1	1.3	
4.8	1.0	1.3	
4.6	0.9	1.1	
4.4	0.8	1.0	
4.1	0.5	0.9	
3.9	0.4	0.7	
3.6	0.3	0.6	

Table S2. The peak position and FWHM of electron kinetic energy distributions measured for solvated electrons in methanol at various $h\nu_{probe}$. The streaming potential (SP) is also given.

$h\nu_{probe}$ (eV)	Peak (eV)	FWHM (eV)	SP (V)
5.8	2.1	2.3	-0.2
5.6	1.9	2.3	
5.4	1.6	2.0	
5.2	1.5	1.8	
5.0	1.3	1.8	
4.8	1.1	1.6	
4.6	1.0	1.4	
4.4	1.0	1.3	
4.1	0.7	1.1	
3.9	0.6	0.8	
3.6	0.5	0.7	

Table S3. The peak position and FWHM of electron kinetic energy distributions measured for solvated electron in ethanol at various $h\nu_{probe}$. The streaming potential (SP) is also given.

$h\nu_{probe}$ (eV)	Peak (eV)	FWHM (eV)	SP (V)
5.8	1.8	2.9	-0.3
5.6	1.5	2.8	
5.4	1.8	2.4	
5.2	1.6	2.3	
5.0	1.3	2.1	
4.8	1.1	1.9	
4.6	1.1	1.7	
4.4	1.1	1.6	
4.1	0.8	1.3	
3.9	0.6	1.1	
3.6	0.5	0.9	

S-II UV photoabsorption spectrum for aqueous DABCO solution

A 500 μM aqueous DABCO (1,4-diazabicyclo[2,2,2]octane) solution was prepared in a synthesized quartz cell with a 10 mm optical path length. Its photoabsorption spectrum was measured using a UV-VIS Spectrophotometer (V-7100, JASCO) with 1 nm resolution from 200 nm to 500 nm. The background absorption by solvent water was subtracted. In Figure S3, the absorbance was divided by the molar concentration and optical path length, and was converted into molar absorption coefficient ε. A portion of a strong absorption band was observed in the region 200–260 nm. The pump wavelength of 226 nm used in our experiment lies on the shoulder of this band.

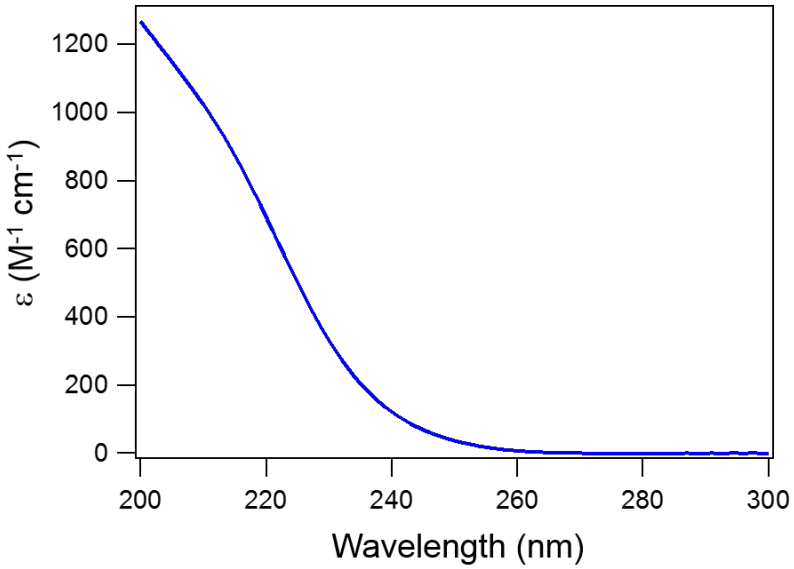

Figure S3. UV photoabsorption spectrum of aqueous DABCO solution.