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Cluster Study of Anion Specificity in Solutions: From Molecular-Like Species to Nano-Sized Droplets[1]

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In this talk, I will present our cluster approach using size-selected, low-temperature photoelectron spectroscopy and ab initio calculations to study a variety of complex anion solvation across the Hofmeister series. Pronounced anion specific effects and rich solute-solvent, solvent-solvent interactions have been discovered en-route to solvation evolution from molecular-like species to nano-sized droplets. We found significant solute anisotropy effects in preferably selecting solvent network to align solute permanent dipole with the solvent electric field in hydrated neutral clusters. Thermodynamic advantage of organic acids in facilitating formation of bisulfate ion clusters, an important issue related to atmospheric chemistry and aerosol particle formation will also be discussed.

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