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Solvent effects on polyelectrolyte charge and conformation in solution RALPH COLBY, SHICHEN DOU, Penn State University — We study partially quaternized poly(2-vinyl pyridine) in a wide range of solvents, with chloride or iodide counterions. Dielectric spectroscopy (conductivity) determines the effective charge on the polymer, which increases systematically with solvent dielectric constant, but is significantly smaller than the Manning prediction for strongly charged polyelectrolytes in high dielectric constant solvents. Small-angle X-ray scattering and specific viscosity are used to provide two independent measures of the correlation length. The results motivate us to include ion solvation effects and both ion-dipole and dipole-dipole attraction effects in the 'solvent quality' of the Dobrynin scaling model. For instance, the stronger dipole of condensed iodide makes ethylene glycol a poor solvent, while it is a good solvent for the polymer with chloride counterions.

Ralph Colby
Penn State University

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