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Homopolymer Dissolution in a Hydrophilic Ionic Liquid DAVID HOAGLAND, JOHN HARNER, UMass Amherst — Dissolution, structure, and dynamics of both neutral and charged polymers dissolved in a hydrophilic room temperature ionic liquid (IL), ethylmethylimidazolium ethyl sulfate [EMIM][EtSO4], have been studied by classical physicochemical methods (static and dynamic light scattering, intrinsic viscosity, refractometry) to determine differences in solution behavior from conventional aqueous and organic solvents. This IL is water miscible. Many neutral polymers and charged polymer salts molecularly dissolve, although solubility doesn't correlate with polymer hydrophilicity. Model neutral soluble polymers are polyvinylpyrrolidone and hydroroxyethyl cellulose while sodium poly(styrene sulfonate) and the iodo salt of methyl-quaternized poly(vinyl pyridine) fill the same role for charged polymers. The latter display none of the polyelectrolyte effects found in low ionic strength water, consistent with strong electrostatic screening in IL. In virial coefficient and coil size, the IL acts for these neutral and charged polymers as a classical good solvent. (Support: UMass MRSEC)

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