

Abstract Submitted
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Dissolving Polymers in Ionic Liquids. DAVID HOAGLAND, JOHN HARNER, Univ. of Massachusetts Amherst — Dissolution and phase behavior of polymers in ionic liquids have been assessed by solution characterization techniques such as intrinsic viscosity and light scattering (static and dynamic). Elevated viscosity proved the greatest obstacle. As yet, whether principles standard to conventional polymer solutions apply to ionic liquid solutions is uncertain, especially for polymers such as polyelectrolytes and hydrophilic block copolymers that may specifically interact with ionic liquid anions or cations. For flexible polyelectrolytes (polymers releasing counterions into high dielectric solvents), characterization in ionic liquids suggests behaviors more typical of neutral polymer. Coil sizes and conformations are approximately the same as in aqueous buffer. Further, several globular proteins dissolve in a hydrophilic ionic liquid with conformations analogous to those in buffer. General principles of solubility, however, remain unclear, making predictions of which polymer dissolves in which ionic liquid difficult; several otherwise intractable polymers (e.g., cellulose, polyvinyl alcohol) dissolve and can be efficiently functionalized in ionic liquids.

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