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Thermoreversible Ion Gels from Supramolecular Assembly via Hydrogen Bonding in Ionic Liquids YU LEI, TIMOTHY LODGE, University of Minnesota — Ion gels are a novel class of functional materials of broad interest for advanced applications. We have developed a thermoreversible ion gel from a supramolecular system consisting of a poly(2-vinylpyridine-b-ethylene oxide-b-2-vinylpyridine) (P2VP-PEO-P2VP) triblock copolymer and a poly(4- vinylphenol) (PVPh) homopolymer dissolved in an ionic liquid, where the P2VP endblocks are capable of forming hydrogen bonds with the PVPh "crosslinkers." Rheology and small angle X-ray scattering (SAXS) were employed to elucidate the gelation and relaxation mechanisms. Interestingly, the rheological data extend over 15 orders of magnitude along the reduced frequency axis, which we ascribed to the strong temperature dependence of hydrogen bonding. We have investigated how the stoichiometry between 2-vinylpyridine and 4-vinylphenol affects the gel quality. We have also investigated how the longest relaxation time and gel point depend on the length of P2VP endblock. The thermal stability and wide liquid temperature range of ionic liquids allow us to explore the fundamental response of this system in greater detail.

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