

Abstract Submitted
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PEO Hydrogels Prepared by End-linking with PAMAM Dendrimers BURCU UNAL, RONALD C. HEDDEN — End-linking is a preferred synthetic technique for preparing polymer networks and gels for fundamental structure/property studies. End-functionalized telechelic linear polymers are joined to a multifunctional crosslinker to form a network in which the molar mass of the polymer chains between chemical crosslink points is known. Although end-linked elastomers prepared in bulk have been well-studied over the preceding decade, much remains to be learned about how the presence of a good solvent affects the equilibrium swelling and modulus of end-linked gels. We prepared well-defined hydrogels in a good solvent (water) by linking epoxide end-functionalized, linear poly(ethylene oxide) (PEO) to the amine endgroups of poly(amidoamine) (PAMAM) dendrimers of generations 0, 2, and 4. Dendrimers can serve as well-defined macromolecular crosslink junctions because they can have nearly monodisperse numbers of reactive endgroups. We have characterized how reaction conditions such as junction functionality, polymer concentration at preparation, ratio of crosslinker endgroups to precursor endgroups, and precursor molar mass affect gelation and equilibrium swelling. We will discuss the somewhat surprising observation of “superabsorbent” behavior in selected PAMAM- PEO gels.

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