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Novel Telechelic Polymer Hydrogels using Homo and Hetero-combinations of End-blocks RAJIV R. TARIBAGIL, MARC A. HILLMYER, TIMOTHY P. LODGE, Department of Chemical Engineering and Materials Science and Department of Chemistry, University of Minnesota — The last two decades have seen telechelic triblock polymers support increasing number of applications as stabilizers and flow modifiers in fields as varied as pharmaceutics, paints and oil recovery. Mainly consisting of a solvophilic mid-block end-capped with solvophobic blocks, their use as flow altering additives stems from their ability to form gels comprising hydrophobic junctions, with hydrophilic blocks bridging these junctions. Previous studies have shown that the chemical nature of the end-block has a direct bearing on the morphology of the gel, which in turn affects its macroscopic properties. We have conducted an examination of this relationship using a variety of techniques including cryogenic scanning electron microscopy (cryo-SEM), small angle neutron scattering (SANS) and rheology. Using homo and hetero-combinations of poly(1,2-butadiene) and poly(perfluoropropylene oxide) as hydrophobic end-blocks with poly(ethylene oxide) as the hydrophilic mid-block, we have demonstrated that the hydrogels obtained are distinct in morphology and physical properties. The study seeks to highlight the importance of controlling end-blocks in triblock polymers as a potential tool towards manipulating the physical properties of gels.

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