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Scale Purification and Characterization of Model Large Poly(isopropyl methacrylate)-block-Poly(styrene) Diblock Copolymers ASEM ABDULAHAD, Rensselaer Polytechnic Institute, DU YEOL RYU, Yonsei University, CHANG YEOL RYU, Rensselaer Polytechnic Institute — The development of purification techniques of block copolymers is vital for overcoming the synthetic difficulty of preparing well-defined block copolymers using various living polymerization techniques. A large scale separation technique would lead us to obtaining sufficient amounts of homopolymer-free block copolymers for subsequent physical characterization. This can potentially aid in the elucidation of the role of chemical heterogeneity on the thermodynamic transitions and viscoelastic properties of block copolymer materials. Employing an acute understanding of polymer adsorption/desorption onto nanoporous silica during solvent gradient interaction chromatography, we demonstrate the large scale purification of anionic polymerized poly(isopropyl methacrylate)-block-poly(styrene) diblock copolymers with narrow molecular weight distribution. Additionally, we address the impact of removing early-terminated poly(styrene) homopolymers on the viscoelasticity of these model diblock copolymers, as well as their impact on block copolymer assembly as analyzed by small-angle X-ray scattering.

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