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Influence of Chemical Heterogeneity on the Viscoelastic Properties of Polystyrene-b-Poly(alkyl methacrylate) Baroplastics[1] ASEM ABDULAHAD, CHANG Y. RYU, Rensselaer Polytechnic Institute — The development of purification and fractionation techniques of block copolymers is important 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. Atom transfer radical polymerization by the activators regenerated by electron transfer method (ARGET-ATRP) was used to prepare a series of polystyrene-b-poly(alkyl methacrylate) copolymers that would inherently consist of homopolymers and a high polydispersity. Leveraging the understanding of polymer adsorption/desorption in solution onto silica and C18-modified silica surfaces during HPLC, we demonstrate how a large scale purification and fraction is achievable using flash chromatography. Finally, the viscoelastic properties of the purified, homopolymer-free block copolymers will be discussed.

[1]NSF PIRE Polymer Program

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