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Well-defined branched polymers for studying surface segregation[1]
BOXI LIU, SHIH-FAN WANG, RODERIC QUIRK, MARK FOSTER, University of Akron — A linear response theory by Wu et al. [1] predicts that the surface segregation of a long-chain branched polymer blended with a linear polymer depends only on the type and number of chain ends or branch points in the linear and branched chains. Our previous neutron reflectivity results suggest that further details of the branching may impact the surface segregation. To better understand the roles of molecular architecture a new set of well defined branched polystyrenes have been synthesized by anionic polymerization. These molecules include a series of 6-arm pom-pom polymers with the same overall number of repeating units, chain ends and branch points, but varying length of central linear portion; a 6-arm star polymer constructed to be a better analog with 6-arm pom-pom polymers; and a deuterated linear polymer more analogous to the branched polymers. Bulk viscosities of these polymers have been measured and their surface segregation is being studied by neutron reflectivity. Reference: 1 Wu, D.T.; Fredrickson, G. H. Macromolecules, 1996, 29, 7919.

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