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Polydispersity-Driven Morphological Transitions in ABC Triblock Terpolymers ADAM J. MEULER, CHRISTOPHER J. ELLISON, CHRISTOPHER M. EVANS, University of Minnesota Department of Chemical Engineering and Materials Science, MARC A. HILLMYER, University of Minnesota Department of Chemistry, FRANK S. BATES, University of Minnesota Department of Chemical Engineering and Materials Science — The use of synthetic polymerization techniques (e.g., controlled radical polymerizations) that often yield polydispersity indices greater than 1.1 is becoming more widespread. Advances in these methodologies have increased the number of monomers amenable to incorporation in block copolymers and will potentially drive commercial costs down. Since many block copolymer properties are governed by the underlying mesostructure, understanding the influence of polydispersity on morphological behavior should prove vital to the success of block copolymer commercialization efforts. This presentation will focus on polydispersity-driven morphological transitions in poly(isoprene-*b*-styrene-*b*-ethylene oxide) (ISO) triblock terpolymers. ISO triblocks with polydisperse polystyrene blocks were prepared by anionic polymerization and their morphological behavior was characterized using small-angle x-ray scattering and dynamic mechanical spectroscopy. Only lamellar microstructures were identified along the $f_I = f_S$ isopleth for polydisperse ISO triblocks, while an orthorhombic network (O^{70}) was previously identified in monodisperse ISO triblocks.

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