

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Network Structures in Poly(isoprene-*b*-styrene-*b*-methyl methacrylate) [ISM] Triblock Copolymer-Homopolymer Blends** MAEVA S. TUREAU, THOMAS H. EPPS, III, University of Delaware — The exploration of the styrene-rich network phase window in the poly(isoprene-*b*-styrene-*b*-methyl methacrylate) [ISM] system is achieved using neat triblock copolymers and via the blending of ISM triblock copolymers with poly(styrene) and poly(methyl methacrylate) homopolymers. Morphological characterization of the neat ISM triblocks and associated blends is accomplished primarily through small angle X-ray scattering (SAXS) and transmission electron microscopy (TEM). The blended specimens exhibit phase transformations that show well-ordered structures and minimal macrophase separation with homopolymer volume fractions up to 26 vol%. ISM triblock-homopolymer blending permitted the identification of phase boundaries between various morphologies including core-shell gyroid, alternating gyroid, and orthorhombic network structures. The phase behavior of the blended mixtures closely matches the phases identified in our neat ISM systems. Additionally, blends from different neat triblocks to the same final component volume fractions exhibit the same nanostructure. This approach provides a robust experimental framework for estimating the compositional window of ISM networks.

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Date submitted: 24 Nov 2009

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