

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

The Effect of Segregation Strength on Network Formation in ABC Triblocks THOMAS EPPS¹, JOON CHATTERJEE, FRANK BATES, University of Minnesota — The effects of segregation strength on network phases were investigated in linear poly(isoprene-*b*-styrene-*b*-ethylene oxide) triblocks with various molecular weights. Morphological behavior at higher molecular weights indicated that network long-range order decreased as the polymer molecular weight increased. The signature Q^{230} and O^{70} X-ray scattering patterns were retained in the lowest molecular weight specimens, while the highest molecular weight data were ambiguous, displaying broad peaks at approximately q^* and $2q^*$. TEM results on these materials showed network-like structures with reduced long-range order. It is unclear whether the highest molecular weight structures represent poorly ordered versions of equilibrium networks or kinetically trapped metastable states. Interestingly, this effect was specific to triply-periodic structures, as lamellar samples of comparable molecular weights displayed excellent long-range order. The reduced organization of the networks likely arises from a decrease in coordinated chain motion as a result of the different diffusion mechanisms available to lamellar versus triply-periodic microstructures.

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Date submitted: 04 Dec 2004

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