## Abstract Submitted for the MAR08 Meeting of The American Physical Society

Well Ordered Melts from Low Molar Mass Pluronic Copolymers Blended with Poly (acrylic acid): Effect of Homopolymer Molar Mass VIKRAM DAGA, University of Massachusetts - Amherst, VIJAY TIRUMALA, Polymers Division, National Institute of Standards and Technology, ALVIN RO-MANG, University of Massachusetts - Amherst, ERIC LIN, Polymers Division, National Institute of Standards and Technology, JAMES WATKINS, University of Massachusetts - Amherst — The use of short chain block copolymer melts as nanostructured templates is often limited by their low segregation strength  $(\chi N)$ . Since increasing molar mass to strengthen segregation also increases the interdomain spacing, it is more desirable to increase the segment-segment interaction parameter,  $\chi$  to produce strong segregation. We have recently shown that block copolymer melts with a molar mass less than 15 kg/mol undergo disorder-to-order transition without a significant increase in interdomain spacing when blended with a selectively associating homopolymer, due to an apparent increase in effective  $\chi$ . Here, we study the effect of homopolymer molar mass on the segregation of a disordered poly (oxyethylene-oxypropylene-oxyethylene) copolymer melt that forms lamellar microstructure in the ordered phase. Based on small-angle scattering measurements, we find that the melts remain ordered over a broad range of homopolymer chain lengths, ranging up to ten times that of the copolymer. This approach has many implications for the use of commodity block copolymer surfactants as inexpensive nanostructured templates for commercial applications.

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Date submitted: 05 Dec 2007

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