Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Effects of depletion interactions on block copolymer micelles SAYEED ABBAS, TIMOTHY P. LODGE, Department of Chemical Engineering and Materials Science, University of Minnesota — Block copolymer micelles exhibit two levels of hierarchical self-assembly: the process of micellization itself, and the ordering of these micelles onto a lattice. By a combination of small angle x-ray scattering and neutron scattering, we show that both levels of self-assembly are affected when non-adsorbing homopolymer is added to the solutions. The phenomena are analogous to depletion interactions in colloid/polymer mixtures. We have chosen poly(styrene-*b*-isoprene) micelles dissolved in diethyl phthalate as the model system. To these solutions polystyrene homopolymer was added. The effects strongly depend on the molecular weight and concentration of the added homopolymer. We find an induced attraction between micelles at moderate micelle concentrations, and a preference for fcc over bcc lattices in more concentrated solutions.

Sayeed Abbas
Department of Chemical Engineering and Materials Science,
University of Minnesota

Date submitted: 20 Nov 2007 Electronic form version 1.4