Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Effects of Sequence Distribution, Concentration and pH on Gradient and Block Copolymer Micelle Formation in Solution STEPHEN MARROU, JUNGKI KIM, CHRISTOPHER WONG, JOHN TORKELSON, Northwestern University — Gradient copolymers are a relatively new class of materials with a gradual change in comonomer composition along the copolymer chain length, which have exhibited unique material properties in comparison to random and block copolymers. Here we extend this architecture to amphiphilic systems that form micelles in solvent, as the effect of a nonuniform comonomer sequence distribution is expected to strongly influence critical aggregation phenomena. Utilizing pyrene as a fluorescence probe, we determined that gradient copolymers present an intermediate critical aggregation concentration in comparison to analogous block and random copolymers. The effect of gradient architecture on a pH-sensitive copolymer was also investigated, concluding that gradient sequencing significantly impacts the solubility and critical aggregation pH when compared to block and random copolymers of similar composition, providing further evidence that gradient architectures introduce a powerful means of tuning properties between block and random copolymers.

Stephen Marrou
Northwestern University

Date submitted: 19 Nov 2010 Electronic form version 1.4