Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Responsive micelles, vesicles and organogels from poly(lysine)-containing block copolymers DANIEL SAVIN, SANDEEP NAIK, JACOB RAY, ASHLEY MONTGOMERY, School of Polymers and High Performance Materials, University of Southern Mississippi — In these studies, amphiphilic AB diblock and ABA triblock copolymers containing poly(lysine) (P(Lys)) were synthesized and their solution assembly studied using dynamic light scattering, circular dichroism spectroscopy and transmission electron microscopy. Rod-coil block copolymers containing P(Lys) are able to self-assemble into responsive micelles and vesicles, as well as organogels and liquid crystals. The hydrophobic block used was poly(propylene oxide), which exhibits a tunable critical point below which the block copolymer is in the "double hydrophilic" limit. In these multiply-responsive materials, we exploit secondary structure changes that occur within the P(Lys) chain to observe changes in solution morphology as a function of solution conditions. This talk will present some recent results on the pH responsiveness of P(Lys)-based ABA triblock copolymers and A_2B 3-arm star copolymers in aqueous media as well as ionic liquids. The effect of morphology changes due to secondary structure transitions will be discussed in the context of the interfacial curvature changes with pH and temperature. These dynamic materials have potential applications as viscosity modifiers, liquid crystals and gels.

Daniel Savin
University of Southern Mississippi

Date submitted: 21 Dec 2009 Electronic form version 1.4