

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Temperature and pH Responsive Chargeable Copolymers with Tunable LCSTs KIATTIKHUN MANOKRUANG, EVANGELOS MANIAS, Materials Sci & Eng; Penn State University — A series of alternating copolymers, made of α,ω -polyethylene glycol oligomers (M_w 400 or 900) alternating with 1,6-diamino-hexane-*stat*-lysine, is presented. Specifically their aqueous phase behavior is outlined, exhibiting temperature-controlled solubility (LCST) and a pH-controlled transition (across the point where lysine is charged). The terpolymers are uncharged at low pH while they become charged (containing lysine anions) when the solution pH increases; the phase diagrams in the temperature and pH space are drawn, and the tunability of the critical points in water as it is controlled by the copolymer composition is discussed. These copolymers, due to their hydrophilic polyethylene-oxide comonomers, exhibit a genuine LCST, i.e., a bona fide first order thermodynamic transition, rather than the usual micellization related LCST of copolymers that contain hydrophobic blocks or grafts. This last point is demonstrated by comparisons against micelle-forming copolymers, consisting of hydrophobic and chargeable comonomers.

Kiattikhun Manokruang
Materials Sci & Eng; Penn State University

Date submitted: 18 Nov 2008

Electronic form version 1.4