

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Disorder-to-order transition of diblock copolymers induced by alkyne/azide click chemistry** XINYU WEI, WEI CHEN, XIANGJI CHEN, TODD EMRICK, THOMAS RUSSELL, Department of Polymer Science and Engineering, University of Massachusetts Amherst — Alkyne/azide click chemistry is shown as a novel approach to induce the disorder-to-order transition (DOT) of diblock copolymers. A series of poly(ethylene oxide)-b-poly(n-butyl methacrylate-r-propargyl methacrylate) (PEO-b-P(nBMA-r-PgMA)) diblock copolymers were prepared and it is shown that the neat diblock copolymers are in the phase mixed state over the temperature range investigated. Microphase separation was observed when the diblock copolymers were mixed with rhodamine B azide and annealed at elevated temperature. The azide molecule reacted with the terminal alkyne groups in P(nBMA-r-PgMA) block and attached to polymer backbone, resulting in a significant increase in the nonfavorable interaction between the two blocks. The DOT of these blends was observed both in the bulk and in thin films. The evolution of the morphology during the transition is determined by the mole ratio between alkyne and azide groups, annealing time and temperature, and interfacial energy.

Xinyu Wei  
Department of Polymer Science and Engineering,  
University of Massachusetts Amherst

Date submitted: 12 Nov 2009

Electronic form version 1.4