Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Thermoresponsive hydrogels from ABC triblock terpolymers CAN ZHOU, TIMOTHY LODGE, MARC HILLMYER, Deparment of Chemistry, University of Minnesota, Twin City — We have prepared novel thermoreversible ABC hydrogels from poly(ethylene-alt-propylene)-b-poly(ethylene oxide)-b-poly(N-isopropylacrylamide) (PEP-PEO-PNIPAm) triblock terpolymers. The terpolymers form micelles in water at low temperatures with hydrophobic PEP cores surrounded by hydrophilic PEO-PNIPAm coronas, and these micelles subsequently associate to form a hydrogel upon heating above the lower critical solution temperature (LCST) of PNIPAm. The separation of micellization and gelation leads to the formation of a two-compartment network with exclusively bridging conformations for the PEO midblocks. Therefore, gelation can be achieved at a much lower concentration, with better mechanical properties and a sharper sol-gel transition, when compared with ABA triblock copolymer hydrogels from PNIPAm-PEO-PNIPAm. The results highlight the intricate nanostructures and new properties available from ABC terpolymer hydrogels.

Can Zhou
Deparment of Chemistry, University of Minnesota, Twin City

Date submitted: 23 Nov 2011 Electronic form version 1.4