Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Micellizationa and Gelation of Water Soluable Thermo-and Light-sensitive Block Copolymer Investigated by SANS LILIN HE, Oak Ridge National Laboratory, BIN HU, BIN ZHAO, The University of Tennessee, Knoxville — Here we present an extensive small-angle neutron scattering (SANS) characterization of micellization and gelation of PEO-b-P(TEGEA-co-NBA) in deuterated water in a wide range of temperatures and concentrations before and after the removal of o-nitrobenzyl group by UV irradiation. Scattering data analysis indicated that unimers predominated in the solutions at low temperatures and concentrations. The polymer self-assembled into micelles with the P(TEGEA-co-NBA) block packed into the core and PEO forming the corona layer. A core-shell model was used to fit SANS data and obtain sizes and scattering length densities. Structural parameters such as the aggregation numbers, the radius of gyration of the chains in the shell region, the number of water molecules in the both regions were determined. The structural information combined with the rheological data were used to describe the phase behaviors of the diblock copolymer in aqueous solution.

Lilin He
Oak Ridge National Laboratory

Date submitted: 14 Nov 2014 Electronic form version 1.4