Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

The Lyotropic Phase Behavior of Diblock Copolymers Swollen with Ionic Liquids[1] PETER SIMONE, University of Minnesota Department of Chemistry, TIMOTHY LODGE, University of Minnesota Department of Chemistry and Department of Chemical Engineering and Materials Science — The lyotropic phase behavior of poly(1,2-butadiene-*b*-ethylene oxide) diblock copolymers (PB-PEO) has been studied upon addition of two ionic liquids, 1-ethyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ([EMI][TFSI]) and 1-butyl-3-methylimidazolium hexafluorophosphate ([BMI][PF_6]). The copolymer/ionic liquid samples ranged from dilute to concentrated, and were characterized via small angle X-ray scattering (SAXS) and cryogenic transmission electron microscopy (cryo-TEM). At moderate to high concentrations, SAXS patterns corresponding to the classical copolymer microstructures of body-centered cubic lattices of spheres, hexagonally packed cylinders, and lamellae were observed. Additionally, at several concentrations, coexisting microstructures and what is thought to be a disordered network microstructure were observed. At low concentration, the morphology of the block copolymer micelles (*i.e.*spheres, cylinders, and vesicles) was used as a qualitative gauge of the ionic liquid solvent quality, and it was concluded that for PB-PEO, [BMI][PF_6] behaves as a more selective solvent than [EMI][TFSI].

[1]Supported by the National Science Foundation award DMR-0406656

Peter Simone
University of Minnesota Department of Chemistry

Date submitted: 26 Nov 2007 Electronic form version 1.4