Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Controlling Phase Separation of Tough Interpenetrating Polymer Networks via Addition of Amphiphilic Block Copolymers. BRIAN ROHDE, RAMANAN KRISHNAMOORTI, MEGAN ROBERTSON, Univ of Houston — Interpenetrating polymer networks (IPNs) offer a unique way to combine the mechanical properties of two thermoset systems. Often used to create a material that possesses both high toughness and tensile properties, here we use polydicyclopentadiene, cured via ring opening metathesis polymerization, to contribute high toughness and diglycidyl ether of bisphenol A cured via anhydride chemistry to contribute high tensile strength and modulus. As the uncompatibilized system reacts in the presence of one another, mesoscopic phase separation occurs and dictates the overall efficacy of combining mechanical properties. To control phase separation and drive the system towards more mechanically robust nanostructed IPNs, amphiphilic block copolymers of polybutadiene-*b*-polyethylene oxide, where one block possesses strong affinity to polyDCPD and the other the DGEBA, were added to the system. Here we present a systematic study of the influence of block copolymer composition in the overall blend on degree of phase separation and morphology using a combination of small-angle x-ray scattering (SAXS) and scanning electron microscopy (SEM) techniques. The resultant mechanical properties are then explored in an effort to link mechanical properties to blend morphology.

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Date submitted: 06 Nov 2015 Electronic form version 1.4