Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Effect of Hydrogen-Bonding Junctions on Microphase Separation in Block Copolymers GREG STONE, University of California Berkeley, JIM HEDRICK, FREDRIK NEDERBERG, IBM Almaden Research Facility, NITASH BALSARA, University of California Berkeley, CPIMA COLLABORATION — The morphology of poly(styrene-block- trimethylene carbonate) (PS-PTMC) copolymers with and without thiourea groups at the junction between the blocks was studied by a combination of small angle X-ray scattering (SAXS) and transmission electron microscopy (TEM). The thiourea groups are known to exhibit inter-molecular hydrogen bonding. We demonstrate that the presence of thiourea groups results in increased segregation between PS and PTMC blocks. We focus on symmetric systems with total molecular weights in the 5 kg/mol range. In conventional block copolymers without hydrogen bonding groups it is difficult to obtain strong segregation in low molecular weight systems because the product chi*N controls segregation (chi is the Flory-Huggins interaction parameter and N is the number of monomers per chain). The incorporation of hydrogen bonding groups may provide a route for the generation of patterns with small, sharply defined features using block copolymers.

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Date submitted: 26 Nov 2007 Electronic form version 1.4