Abstract Submitted
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Phase Behavior and Kinetics of Diblock Copolymer in Selective Solvent[1] JULIAN SPRING, RAMA BANSIL, Boston University — Synchrotron based time-resolved small angle x-ray scattering (SAXS) was used to study the kinetics of the formation of a gyroid phase in solutions of a poly (styrene -isoprene) (SI) diblock copolymer in dimethyl phthalate, a selective solvent for the polystyrene block. Temperature ramp measurements over the range of 70-130C show the transition from hexagonally-packed cylinders (HEX) to Gyroid phase for 75% and 80% (w/v) samples to be 117C and 96C, respectively. Results of temperature jump experiments to different jump depths to examine the kinetics of this transition will be presented. In addition to the Bragg scattering from the ordered phases, we were able to observe the temperature dependence of the diffuse scattering near q=0. The temperature dependence of the correlation length shows a crossover from $\sqrt{T}$ near the glass transition for polystyrene to linear in T near the HEX to Gyroid transition. The effect of adding low molecular weight linear homopolymer PS to the samples on the phase behavior will be discussed.

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