Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Kinetics of Transition between HEX and Gyroid Phases in a Diblock Copolymer Solution in a Selective Solvent**[1] JULIAN SPRING, YONGSHENG LIU, RAMA BANSIL, Boston University, MILOS STEINHART, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic — 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) diblock copolymer in dimethyl phthalate, a selective solvent for the polystyrene block. From temperature ramp measurements on a 75% (w/v) sample, a hexagonally-packed-cylinders (HEX) phase was identified below 110 C, a gyroid between 110 C and 150 C, above which the sample formed disordered spherical micelles. The kinetics of the transitions from HEX to gyroid, gyroid to disorder and disorder to gyroid was examined using temperature jump experiments over the temperature range of 5 165C. We found that the HEX to gyroid phase transition is irreversible, while gyroid to disorder is reversible. Detailed analysis of the time evolution of the Bragg peaks to follow the kinetics of the transition between these phases will be presented

[1]This research was supported by NSF-DMR grant no. 0804784.

Yongsheng Liu
Boston University

Date submitted: 28 Nov 2009 Electronic form version 1.4