

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

A mechanistic study of a thermo-responsive polymer in a liquid crystal solvent TIMOTHY BUNNING, MICHAEL MCCONNEY, JENNIFER HURTUBISE, VINCENT TONDIGLIA, TIMOTHY WHITE, Materials and Manufacturing Directorate, Air Force Research Laboratory — Thermo-responsive polymers are highly promising for a variety of applications including tailored drug release, gene delivery, and chromatography. Typical swelling/de-swelling polymer phase transitions involve isotropic liquids and disordered polymers. Here, we present a unique swelling/de-swelling polymer transition involving structured polymers and ordered liquids crystals. The polymers in this study have a degree of order that is imparted by polymerizing in the presence of a liquid crystal. The study focuses on helicoidal structured polymers templated by cholesteric liquid crystals because the optical properties are a simple indicator of the material structure properties. The mechanism of the swelling/de-swelling transition of this unique system were studied with differential scanning calorimetry, polarized optical microscopy, white light interferometry and visible/near-infrared spectroscopy. Differences in the dynamic optical changes with polymer structure are explored.

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Date submitted: 08 Dec 2010

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