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**The unique behavior of chiral templated polymers swollen with liquid crystals** MICHAEL MCCONNEY, JENNIFER HURTUBISE, VINCENT TONDIGLIA, TIMOTHY WHITE, TIMOTHY BUNNING, Materials and Manufacturing Directorate, Air Force Research Laboratory — Liquid crystals (LC) have the capability of impart a degree of order onto the molecular structure of polymers, essentially acting as “smart solvents.” Furthermore, structured materials have the ability to force liquid crystals into structures that are far from the bulk LC structure. Our studies are aimed at exploring the interplay between LC templated polymers and polymer templated LCs. Specifically we investigated a unique swelling-deswelling phase transition involving an ordered liquid crystal solvent and a structured polymer. The polymer is formed through anisotropic photopolymerization of LC monomers in a chiral LC fluid, is only attached from one surface of a single cell, and only spans a fraction of the cell thickness. The details of the transition were studied with various techniques including DSC, confocal microscopy, polarized microscopy, and visible/near-IR spectrometry. The unusual thermally induced structural changes result in large changes to the reflection wavelength of the cholesteric LC cells.

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