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Temperature Dependent Self-Assembly of Side-Group Liquid Crystalline Block Copolymers in LC Solvent PAUL PIROGOVSKY, ZULEIKHA KURJI, ROHAN HULE, JULIA KORNFIELD, California Institute of Technology — Side Group Liquid Crystalline Polymers (SGLCPs) take on anisotropic conformations in a small molecule LC solvent. This conformation is affected by both the temperature and the sense of attachment of the mesogenic side group (either parallel or perpendicular to the backbone). Covalently linking the SGLCP with a random coil (PS) block leads to a block copolymer that self assembles into anisotropic micelles. Transmission Electron Microscopy was used to view these micelles in real space and determine their size and structure. Small Angle Neutron Scattering (SANS) was performed on dilute (1 wt%) solutions of a series of SGLCPs (homopolymers and block copolymers with a range of polystyrene block lengths) dissolved in deuterated 5CB. A rubbed alignment layer and a magnetic field were used to break symmetry and allow the ordered structure to be seen. PS-b-SGLCP block copolymers were seen to form self-assembled structures that changed qualitatively with the changing PS block length and the temperature. Most intriguingly, several polymers exhibit mutually orthogonal anisotropies at different length scales.

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