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# Thermally and Optically Fixable Shape Memory in Azobenzene-Functionalized Glassy Liquid Crystalline Polymer Networks

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## Abstract

Thermally and optically fixed shape memory is examined in glassy, azobenzene-functionalized liquid crystalline polymer networks (azo-LCN) in the twisted nematic (TN) geometry. The thermal and optical responses of two materials with a large difference in crosslink density are contrasted. The crosslink density was reduced through the inclusion of a monoacrylate liquid crystal monomer RM23. Reducing the crosslink density decreases the threshold temperature of the thermally-induced shape change and increases the magnitude of the deflection. Surprisingly, samples containing RM23 also allows for retention of a complex permanent shape, potentially due to differentiated thermal response of the pendant and main chain mesogenic units of the azo-LCN material.

**Q Keywords:** Liquid crystal polymer   shape memory   azobenzene

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