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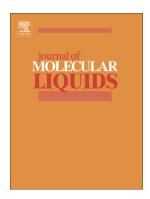
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Enhanced Reflection Band Broadening in Polymer Stabilized Cholesteric Liquid Crystals with Negative Dielectric Anisotropy

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Abstract

The photonic band gap of cholesteric liquid crystal with negative dielectric anisotropies can be broadened under DC electric voltages by polymer stabilization. The broadening is produced by the movement and aligning effect of the dispersed "structural" chiral polymer network. We carried out a systematic study of factors, such as the alignment layer, moisture and ionic additives, which affect the broadening. Our experimental results show that the degree of broadening is strongly dependent on the ion concentration in the polymer stabilized cholesteric liquid crystal. We observed a linear relation between the broadening and the ion density. By using the optimal material formulation, we achieve 3 folds broadening to cover the entire visible light region with low voltages.

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