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Full Paper

Electrical Control of Unpolarized Reflectivity in Polymer-Stabilized Cholesteric Liquid Crystals at Oblique Incidence

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Abstract

The cholesteric liquid crystal phase at or near normal incidence selectively reflects circularly polarized light matching the handedness of the helicoidal superstructure. At large angles of incidence, both senses of circularly polarized light are reflected over a certain wavelength range. Stabilizing the cholesteric liquid crystal phase with low concentrations of polymer network that maintains structural chirality allows the pitch (and accordingly, the selective reflection) to be adjusted with an electric field. Here, the behavior of these polymer stabilized cholesteric liquid crystals is investigated at large angles of incidence, to determine how the total reflection evolves when the polymer network is deformed by an external DC field. Strong, unpolarized reflection is observed in polymer stabilized cholesteric liquid crystals at oblique angles over a wide range of field values. As the application of a DC electric field can adjust the position or bandwidth of the total reflection in polymer stabilized cholesteric liquid crystals, these reconfigurable devices could find potential end use in optical applications where polarization independent properties are needed, such as spectroscopy and polarimetry.

Number of times cited according to CrossRef: 7

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Supporting Information

Filename	Description

Filename	Description
adom201800957-sup-0001-S1.pdf 160.7 KB	Supplementary

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