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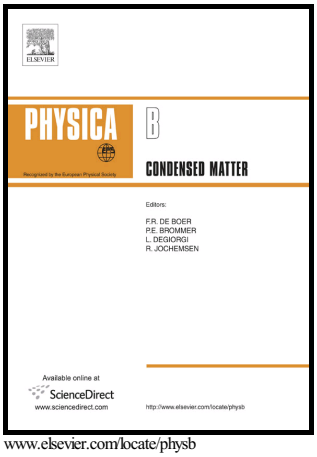

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Studies of absorption coefficient cum electro-optic performance of polymer dispersed liquid crystal doped with CNT and dichroic dye

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Abstract

Absorption coefficient of doped polymer dispersed liquid crystals (PDLCs) is a critical factor for their device performance and depends on dopants parameters like solubility, order parameter and extinction coefficients, in addition to configuration and orientation of the droplets. In this study, a fixed amount (0.125% wt/wt) of multiwall carbon nanotubes (CNTs) and orange azo dichroic dye was doped in PDLC and measured the OFF state absorption coefficient. Considering the theory based on Beer's law and followed by extinction coefficients of CNT and dye, the OFF state transmission for dye doped PDLC was found lower compared to CNT doped PDLC. As a result, absorption coefficient for dye doped PDLC was higher and resulted in the superior contrast ratio. The experimental results were found be consistent with the theoretical results.

Keywords: Liquid crystal (LC), dichroic dye, carbon nanotube (CNT), polymer dispersed liquid crystal (PDLC), absorption.