

Electro-optical properties of Hydrothermally synthesized ZnO nanorods dispersed in nematic liquid crystals

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Abstract

In the present study, electro-optical and optical properties of ZnO nanorods (NRs) dispersed nematic liquid crystal system were investigated. ZnO nanorods were synthesized by hydrothermal method. Three different weight percentages of ZnO NRs have been dispersed in nematic liquid crystal E7. Photoluminescence (PL) spectroscopy, UV–visible spectroscopy, Fourier transform infrared (FTIR) spectroscopy and Dielectric characteristics were studied for ZnO NRs doped nematic liquid crystal in flat geometry. FTIR analysis clearly indicated the influence of nanorod dispersion on the molecular dynamics of nematic liquid crystal. For doped systems, there was a steady rise in PL intensity but the emission peak remained unchanged. With increasing the concentration of ZnO nanorods, UV absorption improved significantly. The findings show that dispersion of hydrothermally produced ZnO nanorods can improve the optical characteristics of nematic liquid crystals substantially.

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