MAGNETIC-FIELD INDUCED ISOTROPIC-NEMATIC PHASE TRANSITION IN PDLC DOPED WITH MAGNETIC NANOPARTICLES

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The polymer dispersed liquid crystals (PDLC) are a novel class of optical composites made from polymer and liquid crystal materials in an appropriate ratio. In this work we studied PDLC which consists of liquid crystal 4-(trans-4'-n-hexylcyclohexyl)-isothiocyanatobenzene (6CHBT) microdroplets dispersed in a polyvinyl-alcohol and doped with single waled carbon nanotubes functionalized with Fe\textsubscript{3}O\textsubscript{4} nanoparticles (SWCNT/Fe\textsubscript{3}O\textsubscript{4}). The volume concentration of the particles was 2 \times 10^{-3}. The phase transition temperature from isotropic to nematic phase in the external magnetic field up to 12T was monitored by precise capacitance measurements in the capacitance cells filled with prepared sample. The shift in the temperature about 0.2°C of the phase transition from isotropic to nematic phase at the external magnetic field of 12T was observed.