

MAGNETIC FIELD INDUCED STRUCTURAL TRANSITIONS IN 6CHBT-BASED FERRONEMATIC DROPLETS

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Ferronematics are stable colloidal suspensions of magnetic particles in nematic liquid crystals. The presence of the magnetic particles enhances the magnetic susceptibility of ferronematics, in comparison with pure liquid crystals. In this work the thermotropic liquid crystal 4-(trans-4'-n-hexylcyclohexyl)-isothiocyanato-benzene (6CHBT) was dissolved in phenyl isothiocyanate and doped with spherical magnetic nanoparticles with aim to increase the sensitivity of the liquid crystal on an external magnetic field. The volume concentration of the magnetic particles was 5×10^{-4} . The phase transition temperature from isotropic to nematic phase in the external magnetic field up to 13T was monitored by precise capacitance measurements in the capacitance cells filled with nematic sample as well as with the prepared ferronematic sample. The shift in the temperature about 9°C of the phase transition from isotropic to nematic phase via droplet state at the external magnetic field of 13T was observed in the sample doped with magnetic particles.

9.7 cm

13.4 cm

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