THE STUDY OF STRUCTURAL TRANSITIONS IN LIQUID CRYSTAL DROPLETS DOPPED BY MAGNETIC PARTICLES.

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Ferronematics are colloidal suspensions of fine magnetic particles in nematic liquid crystals. Their response to external magnetic field sufficiently exceeds that of pure nematics, what encourages investigators in the study of their properties and of the possibilities of their application. The presence of magnetic admixture shifts, compared with pure nematics, the threshold fields of structural transitions invoked by external magnetic or electric fields. The investigation of the changes of these threshold fields is useful for the estimation of the type of anchoring of nematic molecules on magnetic particles surfaces in studied ferronematic. In our present work we study the structural transitions and estimate the type of anchoring and anchoring energy value in MBBA-based ferronematic and in ferronematic droplets, formed in solutions of nematogenic 6CHBT with fine magnetic particles dissolved in phenyl isocyanate. The size of the prepared ferronematic droplets,which are magnetically active, can be easily controlled by the change of temperature and of the molar fraction of dissolved liquid crystal. The magneto-dielectric measurements of various structural transitions in this new system enabled us to estimate the type of anchoring and to find the anchoring energy of nematic molecules on magnetic particles surfaces in droplets.

9.7 cm

13.4 cm

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