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Effect of chiral dopant on the particular orientation of transitions in the drops nematicolesteric

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Abstract

We have studied the orientation quasi-static transformations in drops of nematic cholesteric liquid crystal in the isotropic environment with changing concentration of the cholesteric dopant and under the influence of an external electric field. The case where the droplet radius (R) is less than or of the order of the equilibrium helical pitch (P) induced by the dopant has been considered. It is shown that there exists a critical concentration of the chiral dopant, above which the boundary between the liquid crystal in isotropic phase with the decrease in P initiates the growth of the deformation field with correlation length depending on P . In the case of an electric field, it has been shown that the process of transformation of the initial homeotropic orientation of the liquid crystal molecules of the considered drops has non-threshold character. Such behavior of the boundary "liquid crystal - isotropic phase" is due to the presence of small additions of cholesteric leading with the increase in voltage to the continuous growth of the effective size of the deformation field from the interface of liquid crystal - isotropic phase.