THE STRUCTURAL PHASE TRANSITIONS IN 6CB-BASED FERRONEMATICS

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9.7 cm

Ferronematics are magnetic colloids based on a liquid crystal matrix and were first suggested on theoretical grounds in 1970 by Brochard and de Gennes. The surface anchoring in the magnetic particles couples the magnetic and nematic order and dramatically increases the weak magnetic interaction. The structural transitions in ferronematics based on the thermotropic nematic liquid crystal 6CB (p-hexyl-p'-cyanobiphenyl) were studied. The ferronematic samples were prepared by doping with magnetic suspension consisting of Fe_3O_4 particles (10 nm in diameter) coated with oleic acid as a surfactant, with volume concentration of magnetic particles $\phi_1 = 10^{-4}$, $\phi_2 = 2\text{x}10^{-4}$ and $\phi_3 = 10^{-3}$. Freedericksz transitions were studied in combined electric and magnetic fields. The obtained results show the decrease of the critical magnetic field with increasing volume concentration of magnetic particles.

13.4 cm

Subject category :

5. Nano-structure, Surfaces, and Interfaces

Presentation mode :

poster

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