THE STRUCTURAL TRANSITIONS IN LIQUID CRYSTALS DOPED WITH FINE MAGNETIC PARTICLES

P. Kopčanský[a], M. Koneracká[a], L. Tomčo[a], I. Potočová[a], M. Timko[a], J. Jadżyn[b] and G. Czechowski[b]

[a]Institute of Experimental Physics, Slovak Academy of Sciences, Watsonova 47, 043 53 Košice, Slovakia

[b]Institute of Molecular Physics, Polish Academy of Sciences, Smoluchowskiego 17, 60 179 Poznań, Poland

9.7 cm

Liquid crystals were doped with fine magnetic particles (10 nm in diameter) in order to increase their response to an applied magnetic field. The stable systems, so called ferronematics and ferrosmectics, were prepared for MBBA, 7CB and 8CB liquid crystal bases respectively. Structural transitions (the magnetic and electric Fredericksz transition under influence of the magnetic field) in various experimental arrangements were indicated by means of dielectric and conductivity measurements. Change of the corresponding elastic constants and the threshold transition fields were investigated as a function of external magnetic field and the concentration of fine magnetic particles added to liquid crystals. The experimental results showed increase of electric and magnetic threshold fields vs concentration of magnetic particles in 7CB and 8CB cases while decrease of threshold magnetic field in MBBA case. The Burylov-Raikher theory was used for calculation of the threshold fields in the measured experimental arrangements and good qualitative agreement between this theory and experiment was found.

13.4 cm

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Corresponding author :
P. Kopčanský

Address for correspondence :
Institute of Experimental Physics, SAS
Watsonova 47, 043 53 Košice
Slovakia

Email address :
kopcan@saske.sk