

ORIENTATIONAL BEHAVIOR OF A NEMATIC LIQUID CRYSTAL FILLED WITH INORGANIC OXIDE NANOPARTICLES

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S u m m a r y

We report the results of dielectric spectroscopy, Fourier transformed infrared spectroscopy (FTIR) and atomic force microscopy (AFM) studies performed on the nematic liquid crystal (LC) mixture Merck ZLI-1132 filled with TiO₂ (rutile and anatase) and SiO₂ nanoparticles. The observed static dielectric permittivities are interpreted in terms of orientation of the LC with respect to the measuring electric field. Adding of SiO₂ particles mainly induces a statistical orientation of LC molecules, whereas TiO₂ particles promote the perpendicular orientation. The dynamics of LC molecules in all systems is very similar. The reason for the slightly faster reorientation observed in the mixtures may be connected with a disturbed nematic order near the surface of solid particles.