

Effect of Doping Process on Structural Properties of Liquid Crystals

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Abstract. Hybrid material attract numerous interests in various industrial applications nowadays. Integration of nanoparticles with electric, magnetic, and semiconducting properties are used to tune liquid crystals basic properties to increase or decrease their behaviour under applied external magnetic or electric fields. Synthetized nanoparticles shapes and concentrations defines their interactions with liquid crystal host. In this contribution, various liquid crystals (LC) and dopands are investigated under applied external magnetic or electric field, considering the colloidal stability and structural changes in host LCs. To examine these changes acoustic spectroscopy utilizing SAW (surface acoustic wave) and optical transmission techniques were used. The doping with nanoparticles affects both threshold field and nematic-isotropic transition shift which can be registered by SAW attenuation or optical transmittance change. The effect of particle concentration and size plays an important role for orientational coupling between dipole moments of LC molecules and nanoparticles. Therefore, the magnitude of structural changes invoked by the external field are dependant from these parameters.