

Morphology and electro-optical properties of nematic liquid crystal/Aerosil[®] nanoparticles

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Nanoparticles and liquid crystals attract increasing interest among researchers for their use in areas such as drug delivery and high tech devices. Liquid crystalline materials play an important role in the synthesis of well defined shape and size nanoparticles, at the same time nanoparticles dispersed in liquid crystals allow to investigate the defect formation in liquid crystal suspensions and to enhance the light scattering properties of nematic cells. In this paper we have studied the morphology and the electro-optical properties of thin films of nematic liquid crystal / Aerosil[®] nanoparticle composites, where the Aerosil[®] nanoparticles were interconnected each other by free radical polymerization. The prepared cells are characterized by high contrast ratios, large switching electric fields but very fast relaxation times. In addition, memory effects affect samples as Aerosil[®] particles tend to generate local defects in liquid crystal after the first switching run.