

Memory Effect Phenomena in Doped Liquid Crystals

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Abstract. This study explores the memory effect in nematic liquid crystals (NLCs) when doped with various nanoparticles. The experimental approach focused on observing how changes in the dopant and concentration of nanoparticles affect the light transmission through NLCs under applied external field. Such insights are invaluable for designing next-generation liquid crystal devices with tailored properties for specific applications, ensuring optimal performance and durability with introduction of role of nanoparticles in LC systems. It is evident that while some nanoparticles like SiO_2 enhance the memory effect, others like Fe_3O_4 might introduce undesirable complexities. The enhanced memory effects facilitated by nanoparticles open numerous applications in advanced display technologies, including flexible displays and high-resolution screens. Additionally, the findings have significant implications for the design of optical switches and sensors that operate under low-power conditions, enhancing the energy efficiency of these devices.

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