



## **Structural Studies on Citrate Capped Gold Nanoparticles Dispersed in Liquid Crystals**

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**Abstract:** Liquid crystals act as tunable solvents for the dispersion of nanomaterials and they are being anisotropic media, provide a very good support for the self assembly of nanomaterials in to large organized structures in multiple dimensions. Nanoobjects that are dispersed in the liquid crystals can trap ions, which decrease the ion concentration and electrical conductivity and improve the electro-optical response of the host. The synthesis and characterization are carried out on liquid crystalline *p*-decyloxy benzoic acid *p*-undecyloxy benzoic acid (10OBA & 11OBA) with 30  $\mu$ l citrate capped Gold (Au) nanoparticles dispersion. Spectroscopic techniques like XRD, SEM, FTIR and DSC were performed on to the prepared samples. The results showed that the dispersion of citrate capped Au nanoparticles in 10OBA and 11OBA exhibited nematic phases as same as the pure liquid crystals, with reduced clearing temperature as expected. The smectic-C thermal ranges are enhanced and the nematic thermal ranges are changed slightly in DSC with the dispersion of citrate capped Au nanoparticles.

**Keywords:** Synthesis, Polarizing Optical Microscope (POM), Differential Scanning Calorimeter (DSC), Nano dispersion, X-ray Diffraction studies (XRD), Scanning Electron Microscopy (SEM) and Fourier Transform Infra Red Spectroscopy (FTIR).

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