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Dielectric Anisotropy of Gold Nanoparticle Colloids in Nematic Liquid Crystals ANGELO VISCO, JON FOUST, RIZWAN MAHMOOD, JOSEPH BELOBRADICH, Slippery Rock Univ — We present electrical and optical studies of hexanethiol-treated gold nanoparticle (GNPs) colloids in 4-cyano-4′-pentyl-biphenyl (5CB) liquid crystals. Preliminary data analysis suggests an unusual behavior of sudden drop and then rise in the dielectric anisotropy at a critical concentration of 0.0862% by wt. GNPs and a sudden rise and then drop in the nematic to isotropic transition temperature. Above the critical concentration the data level off to within the uncertainty of the experimental errors. This colloidal system will help us to understand the interaction and the effects of nanoparticles on the self-assembly of LC molecules and the manner in which these particles organize in LC. This study is important for further developments in nanotechnology, sharp and fast display panels, and within the medical field.

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