

## Structural study of PDLC doped with nanomaterial.

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Polymer Dispersed liquid crystal (PDLC) materials represent a radical alternative to conventional- filled polymers. The reinforcement of polymers are done by fillers, which plays a major role in strengthening the composite.

The extraordinary mechanical and electrical properties of Carbon Nanotubes make them ideal dopant candidate. On the other hand Zinc Oxide, Gr.IV Semiconductor having a band gap of 3.37eV displays luminescent properties in the near ultra violet and visible regions, offers a wide scope to study and analyze the interaction of the composite sample.

In the present paper, we doped PDLC prepared by using Nematic liquid crystal TL205 (Halogenated bi-tri phenyls with aliphatic tails of length of 2-5 Carbons) and Pre-polymer PN393 (mixture of acrylate monomer that form a crossed link network )in the ratio 80:20. In this mixture we dispersed small concentrations ( $\leq 1\%$ ) of Zinc oxide nanoparticles and ( $\leq 0.05\%$ ) of MWCNT. The samples are studied for Structural changes using Fourier Transform Infrared Spectroscopy(FTIR), the most preferred technique for material analysis. We also Carried out UV-Visible spectroscopy in Transmission mode in order to have an insight on PDLC nanoparticle interaction. Results of this study shall be presented.

References:

- 1) S.Shah et. al. I Nucl.Instr. and Meth. In Phys. Res. (2008) B 266,1768-1774.
- 2) A.V. Sadovoy\*, V.F. Nazvanov, Proc. of SPIE (2006)Vol. 6164, 616407-1
- 3) O. Yaroshchuk, L. Dolgov, and A. D. Kiselev\*, PHYSICAL REVIEW (2005) E 72, 051715