

# Morphology characterization of polymer dispersed liquid crystals doped with oxidized multi-walled carbon nanotubes

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In this work we carry out an experimental investigation into the morphological effects of doping oxidized multi-walled carbon nanotubes (MWNT) in thiolene and acrylate based polymer dispersed liquid crystals (PDLC). Effect of various concentrations of MWNT on the photo polymerization induced phase separation of LC is quantified based on scanning electron microscopy imaging [1][2]. Optical and polarised optical microscopy imaging is carried out to determine the actual role of MWNT as participants in the phase separation or inhibitors for the LC during the phase separation process. Imaging results indicate that the MWNT gets trapped in the polymer matrix rather than diffusing along with the LC. The diffusion constant of MWNT in such a medium is computed and compared with those of bulk monomers and LC. Observations show that although size of the LC droplets are significantly altered in the presence of MWNT no significant changes in the shape is observed especially at the interface of the polymer and LC droplet. Any micro-morphological changes or defects at this interface would contribute to the electro-optic properties.

## References:

[1] R. Benmouna, V. Rachet, P. Barny, P. Feneyrou, U. Maschke, X. Coqueret, *Journal of Polymer Engineering*, **2006**,27,655-67027

[2] K. Amundson, A. Blaaderen and Pierre Wiltzius, *Physical Review E*, **1997**, 55, 1646

## Figures:

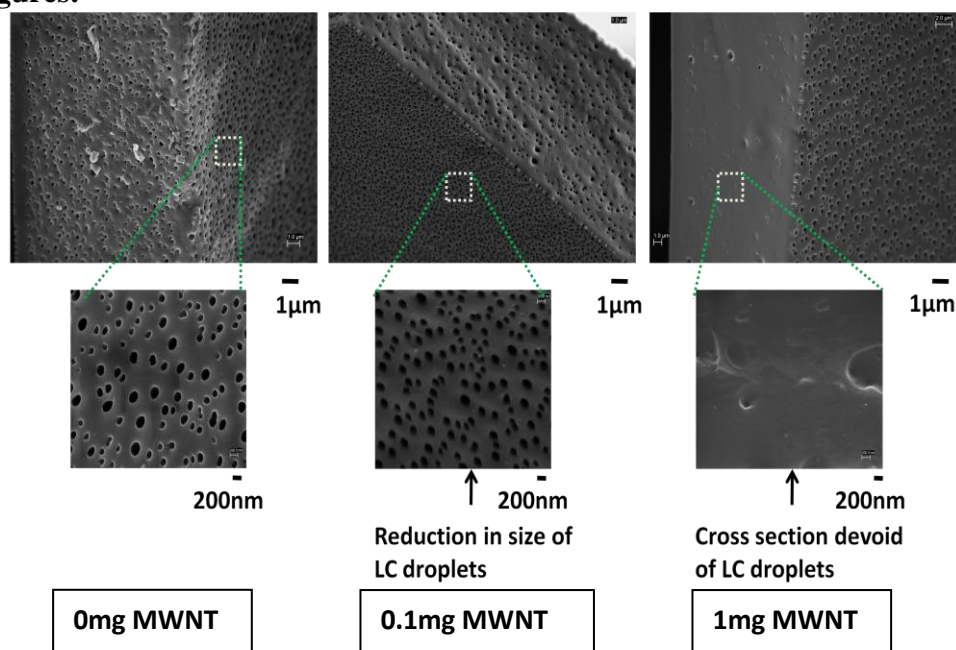


Fig1: Scanning imaging microscopy images of Thiolene PDLC with various concentrations of MWNT