

# A Polymer Stabilized Liquid Crystals

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Polymer stabilised liquid crystals[1] are formed by photo-polymerisation of a small amount of (mesogenic) bifunctional monomers within a liquid crystalline host. The rod-like monomers initially align with the liquid crystal and during the polymerisation this self-organised liquid crystalline order transfers onto the forming network. As a result, a phase separated polymer network is formed which templates the liquid crystal phase in which it was formed.

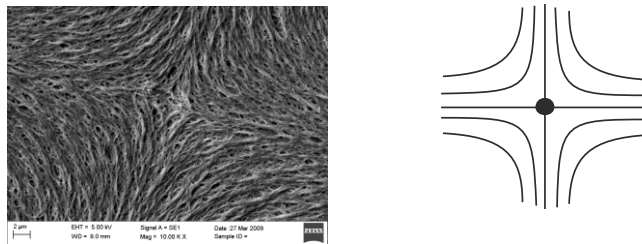


Fig.1: SEM image of a polymer network formed in a  $s=-1$  Schlieren defect of a nematic phase, and schematic director configuration.

We will present several different aspects of polymer stabilised liquid crystals, such as visualisation of nematic defects, as shown in figure 1, structure determination of frustrated twist grain boundary phases with discontinuous directional changes of uniform order, and the formation of helical polymer networks in cholesteric or chiral nematic phases.

Polymer stabilised liquid crystals have numerous applications, from imaging of defect structures to the potential use as electronic paper, from self-organised photonic structures to smart heat reflecting windows, or simply to stabilise display geometries and make switching processes faster.

## References:

[1] I. Dierking, *Adv. Mater.*, **12**, (2000), 167