Incorporation of charged nanoparticles into LLC matrices

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We present a facile method to incorporate charged nanoparticles into lyotropic liquid crystal (LLC) template. This method requires addition of polymer and it goes through the phase separation process [1]. As a result we obtain ordered LLC phase of surfactant filled with nanoparticles. The type of ordering of the matrix is easily controlled by the amount of polymer used to induce the phase separation. The method presented enables fabrication of the templates doped with positively or negatively charged nanoparticles as well as with a mixture of oppositely charged nanoparticles in arbitrary proportions.

micelles

nanoparticles

Schematic representation of ordered LLC matrices doped with nanoparticles.