Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Nanoparticle organization in surfactant mesophases
GURUSWAMY KUMARASWAMY, National Chemical Laboratory, Pune, India, KAMENDRA SHARMA, NCL, Pune, India — Dispersing colloidal particles in surfactant liquid crystalline phases leads to the formation of materials with ordered microstructures. The influence of the liquid crystalline medium leads to organization of the colloidal particles, and the driving force for self-assembly scales with the size of the colloids. Micron-sized colloids organize into linear arrays in liquid crystals, while nanoparticles can be confined in surfactant liquid crystal structures. We investigate the dispersion of silica nanoparticles with sizes of 7, 11 and 23nm in hexagonal mesophases of aqueous solutions of nonionic surfactants. The surfactant mesophase is preserved after dispersion of these particles, and the particles organize to form lamellar structures. We will discuss the implications of our results for the synthesis of novel materials.

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Date submitted: 16 Nov 2006 Electronic form version 1.4