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Magnetic Field Driven Alignment of Lamellar and Hexagonal Surfactant Mesophases for Templated Synthesis of Nanomaterials PAWEL MAJEWSKI, CHINEDUM OSUJI, Yale University — The use of both ionic and non-ionic surfactants as structure directing agents in the solvothermal synthesis of nanomaterials has become a well established practice. Nevertheless, the production of monolithic well aligned surfactant mesophases for use in the templated synthesis of ordered, anisotropic nanomaterials remains a significant challenge, particularly in the thin film geometry where shear alignment cannot be conveniently applied. Magnetic fields hold promise in this area, but to date have only been used in the alignment of hexagonal phases of ionic surfactants. We show that judicious application of high magnetic fields can in fact be used for diamagnetic alignment of non-ionic surfactants in both the lamellar and hexagonal phases, leading to very highly ordered systems suitable for nanomaterials synthesis.

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