

Magneto-responsive surfactants: from self-assembling to single atom mesoporous materials

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Magneto-responsive surfactants¹ gathered increasing attention and were already used to design several molecularly organized systems such as magnetic micelles or microemulsion or to magnetize DNA. Due to their unique magnetic-responsiveness, the self-assembling mechanism in out-of-equilibrium systems can be accurately investigated as well as the composition and the distribution of surfactants between the self-assembled systems and the aqueous bulk. This was demonstrated on paramagnetic vesicles formed from ion pairs of iron-containing magnetic surfactants⁴. Moreover, magneto-responsive surfactants can be used for material design.⁵ In this context, it will be firstly presented the structuring and the magnetization of hexagonally ordered mesoporous silica². Then it will be shown that magneto-responsive surfactants combined with solid lipid nanoparticles (SLNs) can be used as colloidal tools for meso-macroporous supported catalyst³. Catalytic performance in a Fenton-like reaction will be then evaluated for methylene blue degradation using single iron catalyst or iron oxide nanoparticle supported on silica.

Keywords: *Magnetic surfactant, Vesicle, Spin crossover, Mesoporous silica, Catalysis*

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