

Abstract Submitted
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X-ray magnetic scattering studies of Fe₃O₄ nanoparticles KARINE CHESNEL, MATEA TREVINO, ANDREW WESTOVER, BYU Physics dept, ROGER HARRISON, BYU Chemistry Dept, ANDREAS SCHERZ, SSRL, Stanford — Magnetite (Fe₃O₄) particles exhibit a superparamagnetic behavior when their size are in nanometer scale. Such nanoparticles could potentially be used for applications in the medical field. We are interested in investigating the magnetic order and fluctuation dynamics in self-assemblies of such nanoparticles. Our Fe₃O₄ nanoparticles are prepared by an organic route and range from 2 nm to 50 nm in size. They are deposited on membranes where they self- assemble. We have been studying the magnetic order using X-ray resonant magnetic scattering (XRMS) at the SSRL synchrotron facility in Stanford. This unique technique, combined with X-ray Magnetic Circular Dichroism (XMCD), provide information about the spatial distribution of the particles and their magnetic interaction. We are studying the magnetic signal under the application of magnetic field and at different temperatures to prepare future dynamical measurements near the blocking temperature.

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