

Abstract Submitted
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Array Formation and Size Effects in Chemically Synthesized FePt Nanoparticles¹ LEVENT COLAK, GEORGE HADJIPANAYIS, Department of Physics and Astronomy, University of Delaware — FePt nanoparticles with controlled size have been synthesized following a route given by Shukla et. al.[1] The effect of particle size on the magnetic properties has been investigated for nanoparticles with sizes of 3.0 and 6.0 nm. With the addition of the surfactants at a later stage of preparation, a long range self-assembled array of particles was obtained as evidenced by transmission electron microscope (TEM). By comparing bright field images of the samples with projected potential image simulations[2], the packing structures and stacking sequences of the arrays were identified. Well-aligned mono and multi layered hcp to bcc nanostructures are formed from 5 nm FePt nanoparticles. Subjecting the NP's to thermal processing at 800 °C results in a transformation of the nanoparticles from the disordered fcc phase to the ordered L1₀ phase. HRTEM studies have been carried out to investigate the development of particle morphology and microstructure during the synthesis and subsequent annealing of nanoparticles. 1. N. Shukla, C. Liu, A. G. Roy, *Matt. Lett.* 60, 2006, 995-998. 2. S. Yamamuro, D. F. Farrell and S. A. Majetich, *Phys. Rev. B* 65, 224431 (2002).

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