

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Magnetite-Alginate-AOT nanoparticles based drug delivery platform R. REGMI, C. SUDAKAR, A. DIXIT, R. NAIK, G. LAWES, Department of Physics and Astronomy, Wayne State University, U. TOTI, J. PANYAM, College of Pharmacy, University of Minnesota, P.P. VAISHNAVA, Kettering University — Iron oxide having the magnetite structure is a widely used biomaterial, having applications ranging from cell separation and drug delivery to hyperthermia. In order to increase the efficacy of drug treatments, magnetite nanoparticles can be incorporated into a composite system with a surfactant-polymer nanoparticle, which can act as a platform for sustained and enhanced cellular delivery of water-soluble molecules. Here we report a composite formulation based on magnetite and Alginate-aerosol OT (AOT) nanoparticles formulated using an emulsion-cross-linking process loaded with Rhodamine 6G [1]. We prepared two set of nanoparticles by using Ca^{2+} or Fe^{2+} to cross-link the alginate polymer. Additionally, we added ~ 8 nm diameter Fe_3O_4 magnetic nanoparticles prepared by a soft chemical method to these alginate-AOT nanoparticles. The resulting composites were superparamagnetic at room temperature, with a saturation magnetization of approximately 0.006 emu/g of solution. We will present detailed studies on the structural and magnetic properties of these samples. We will also discuss HPLC measurements on Rhodamine uploading in these composites. [1] M.D.Chavanpatil, Pharmaceutical Research, vol.24, (2007) 803.

R. Regmi
Department of Physics and Astronomy, Wayne State University

Date submitted: 05 Dec 2007

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