

Abstract Submitted  
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**High Coercivity FePt Nanoparticles Synthesized Using the Particle Gun**<sup>1</sup> M.J. BONDER, Y.H. HUANG, P. LIU, J. WAN, Y. ZHANG, G.C. HADJIPANAYIS, University of Delaware, Newark De 19716, D. WELLER, Seagate Technology, Pittsburgh, Pa 15203 — Chemically ordered FePt nanoparticles pose a potential solution to the superparamagnetic limit for magnetic recording media. This paper presents the synthesis and characterization of high coercivity face centered tetragonal nanoparticles with sizes in the range of 4 to 6 nanometers. As deposited samples are face centered cubic as shown by selected area diffraction. Magnetic measurements made using SQUID and vibrating sample magnetometry confirm this as the nanoparticles are soft ferromagnets. Upon heat treatment the nanoparticles transform to the chemically ordered face centered tetragonal (FCT) phase. Magnetic measurements of the annealed samples reveal a high coercivity in excess of 10 kOe for the appropriate annealing conditions commensurate with the high anisotropy FCT phase. Some unwanted agglomeration is inevitable with post synthesis annealing as indicated by bright field electron micrographs. The use of an in-situ heater stage in dynamically annealing the nanoparticles will be discussed as relates to the L10 transformation and its limits.

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