Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Chemically Synthesized FePt Binary Alloy Nanoparticles with Different Shapes[1] L. COLAK, Y. HUANG, M.J. BONDER, G.C. HADJIPANAYIS, Dept. of Physics and Astronomy, U of Delaware, Newark,DE,USA, D. WELLER, Seagate Technology, Pittsburg, PA,USA — Chemically synthesized FePt nanoparticles are promising candidates for future high density magnetic recording media. In this work, FePt and $FePt_3$ binary alloy nanoparticles have been synthesized by thermal decomposition of iron pentacarbonyl ($Fe(CO)_5$) and reduction of platinum acetylacetonate (Pt $(acac)_2$) in the presence of oleic acid (OA) and oleyl amine (OY) surfactants at low refluxing temperatures. $FePt_3$ and FePt nanoparticles were obtained by varying the Fe:Pt molar ratio in the range of 1.4-1.7. With control of the heating rate to the refluxing temperature, nanoparticles with a size of $\sim$5 nm and with different shapes were obtained for both compositions. The particles showed very little agglomeration to an annealing temperature of 650^oC, as observed using X-Ray Diffraction (XRD) and Transmission Electron Microscopy (TEM). Magnetic measurements show that annealing at 700^oC partially transforms the FePt and $FePt_3$ nanoparticles from the disordered fcc phase to the ordered $L1_0$ and $L1_2$ phases, respectively. HRTEM and Mossbauer studies will be discussed in terms of the temperature and time dependent evolution of microstructure with annealing.

[1]Work supported by NSF DMR-0302544 and Seagate Technology

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Date submitted: 04 Dec 2005 Electronic form version 1.4