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Reduction of Ordering Temperature in Substituted FePtM (M = Ni,Cu) Nanoparticles Formed by Chemical Synthesis HONGLI WANG, YUNHE HUANG, YONG ZHANG, KARL UNRUH, GEORGE HADJIPANAYIS, Department of Physics, University of Delaware, DIETER WELLER, Seagate Technology, Pittsburgh, T. SIMOPOULOS, IMS, NCSR DEMOKRITOS, AGIA, PARASKEVI, ATHENS 15310, GREECE — FePt and CoPt-type nanoparticles made by chemical synthesis have recently become promising candidates for ultra-high density magnetic recording media [1]. However, at high annealing temperatures, the particles sinter together and array formation is lost. Recent studies [2] have reported reduced transformation temperatures with the addition of Ag and Au in the FePt nanoparticles. In this study, we used M = Ni, Cu substitution to reduce the transformation temperature. The as-made FePtNi and FePtCu have the disordered fcc structure with zero coercivity at room temperature. After annealing at temperatures in the range of 300-600 ^{o}C, the particles become fct with a coercivity of 4 kOe in FePtCu at 400 ^{o}C and 6 kOe in FePtNi at 500 ^{o}C. The high coercivity obtained at the lower annealing temperature suggests a lower transformation temperature in both alloys. Preliminary DSC studies showed a reduced transformation temperature in the Ni substituted samples. The structural transformations that occur after annealing and their effects on magnetic properties are currently being investigated by HREM and Mössbausser spectroscopy. References [1] S. Sun, et al. Science, 287, 1989-1992 (2000) [2] S. Kang, et al., IEEE T MAGN, 39, 5, 2753 (2003)

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