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Facile Synthesis of L10 FePt/Reduced-Graphene Oxide Nanocomposites XIAOCAO HU, VASILIS TZITZIOS, University of Delaware, DAVID SELLMYER, University of Nebraska, GEORGE HADJIPANAYIS, University of Delaware — FePt nanoparticles (NPs) have attracted much attention recently for applications in high density recording media and catalysis. Usually the as-made FePt NPs are in the fcc phase and must be annealed at high temperatures to be converted to the L10 (fct) structure and because of this the particles agglomerate. In this paper, we used a novel fabrication method to directly prepare FePt NPs in fct phase on the surface of R-GO (Reduced Graphene oxide). A layered bimetallic precursor Fe(H2O)6]PtCl6 was mixed in water environment with exfoliated GO.The precipitates were annealed under a forming gas (5% H2 and 95% Ar)atmosphere at different temperatures varying from 500 °C to 950 °C. During the annealing process, the layered precursor [Fe(H2O)6]PtCl6 was reductively decompose directly to the L10 FePt crystal structure while the GO reduced by H2 atmosphere. Transmission electron microscopy (TEM) results showed that the FePt NPs have the L10 structure and a uniform size distribution with their average particle size in the range from 5 nm to 28 nm depending on the annealing temperature used. The fct particles had coercivity values in the range of 6 kOe-9 kOe. Furthermore,, it is clear that the FePt nanoparticles are formed only on the surface of the graphene and no individual particles were observed off the graphene. The L10 FePt NPs are still isolated on the surface of the graphene and the particle size remains quite small (8 nm) even at annealing temperatures as high as 750 °C. Work supported by DOE-BES-DMSE (Grant No. DE-FG02-04ER4612)

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