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Preparation and orientation of ordered FePt:Ag magnetic nanostructures[1] M. L. YAN, Y. F. XU, D. J. SELLMYER, Center for Materials Research and Analysis and Dept. of Physics and Astronomy, Univ. of Nebraska — Magnetic nanostructures are scientifically interesting because of the unique physical characteristics. To take advantage of these properties in applications, it is important to be able to control the properties of particles. For example, in the applications of high-density perpendicular recording media, it is important for films to have decoupled or weakly-interacting, uniformly-sized grains with diameters less than 10 nm as well as perfect perpendicular orientation. The fabrication of magnetic nanostructures with these desirable properties is a major challenge. In this talk, we will present research on fabrication and orientation of FePt:Ag nanostructures. The requirement of narrow size distribution can be met by creating particles with a gas-aggregation cluster deposition. Crystallographic texturing of nanostructures can readily be done by multilayer sputter deposition plus annealing. We discuss preparation, formation of the nanostructures, and mechanism and dynamics of magnetization reversal for FePt:Ag nanostructures with narrow cluster-size distribution. Results on effects of Fe composition, Ag content, total film thickness on ordering and orientation will be reported for oriented FePt:Ag nanostructures. In addition, the lattice parameters, coherence length and exchange interactions will be reported for these FePt:Ag nanostructures.

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