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P-080 MAGNETIC PROPERTIES OF BARIUM FERRITE THIN FILMS ON Pt(111) BY A SOL-GEL METHOD

Chul Sung Kim, Sang Won Lee, Sung Yong An and In Bo Shim

Crystallographic and magnetic properties of barium hexaferrite thin films prepared by a sol-gel method were investigated. Barium nitrate and iron nitrate was used as starting materials, and were combined so that composition ratio Ba/Fe=1/10. These were dissolved in methanol and distilled water. The solution was refluxed at 353 K for 24 h. The resulting precursor solution were made at 0.2 M. Films were spin-coated onto Pt (111)/Ti/SiO2/Si (100) substrates (10¡¿10 mm), dried and then heated in air at various temperatures. High coecivities were obtained in these nanocrystalline thin films, 4~5 kOe for hexaferrite. The crystal structures were measured by XRD and magnetic properties were measured using a VSM at a maximum applied field of 10 kOe. An AFM was used to detect the grain size and surface morphology. The surface roughness of the films was between 2 and 5 nm. The perpendicular coercivity HC¡Ñ and in-plane coercivity HC¡«were 4310 Oe and 4480 Oe, respectively, at room temperature under an applied field of 10 kOe. This shows that the film has isotropic properties. The perpendicular coercivity squareness S*, a measure of the slop of the loop at HC, are 0.56. The orientation coefficients S=Mr/Ms in both the parallel and perpendicular directions are analyzed as a function of after annealing temperature. Above 1023 K insignificant differences are observed and the corresponding values lie around 0.5, revealing that thin films are magnetically isotropic