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#### MAGNETIC PROPERTIES OF Cr/CoCrSm/Cr THIN FILMS FOR HIGH DENSITY MAGNETIC RECORDING.

KI HWAN, KWON, Y. G. HONG, C. O. KIM  
(Dept. of Mat. Eng., Chungnam National Univ., Taejon 305-764, Korea)

The magnetic properties and microstructure of Cr/CoCrSm/Cr multilayers have been studied. The multilayers were grown by using a rf magnetron sputter. Bottom Cr layer was introduced to control the morphology of CoCrSm magnetic layer and top Cr layer provides the magnetic stability against atmospheric degradation. Coercivity of as-grown Cr/CoCrSm/Cr multilayer is 300-400 Oe. However, it increased to 5,600 Oe after annealed at 500°C for an hour. X-ray and SEM analyses show columnar shaped  $\text{Co}_{17}\text{Sm}_2$  phase is formed during annealing and the  $\text{Co}_{17}\text{Sm}_2$  phase is considered to be responsible for the remarkable increase of the coercivity.

### P-110

#### MAGNETIC PROPERTIES OF FeZrN/SiO<sub>2</sub> SOFT MAGNETIC MULTILAYER THIN FILMS. TAEK S. KIM, Y. G. HONG and C. O. KIM (Dept., Mat., Eng, Chungnam National Univ., Taejon 305-764, Korea)

$\text{Fe}_{75.5}\text{Zr}_{8.3}\text{N}_{16.2}/\text{SiO}_2$  multilayer thin films were fabricated by rf magnetron sputtering method. Saturation magnetic flux density and coercive force were investigated as a function of annealing temperature. The effective permeability shows about 3,000 at 1 MHz and thermal stability was also examined. It is considered that the good soft magnetic properties are due to the prohibition of  $\alpha$ -Fe grain growth by the precipitated nanocrystalline ZrN particles. The sizes of  $\alpha$ -Fe grains and nanocrystalline ZrN particles were measured to be 40~50 Å and 10~15 Å, respectively. Multilayer film was improved in high frequency softness so that its effective permeability is up to 1,600 at 40 MHz.

### P-111

#### THE EFFECT OF HEAT TREATMENT ON PERPENDICULAR MAGNETIC PROPERTIES IN SPUTTERED Co/Cr AND Co/Mo MULTILAYER THIN FILM, D. H. KIM, S. U. PARK and I. T. NAM

(Dept. of Mat. of Sci and Eng., Kangwon National Univ., Chunchon 200-701, Korea)

Sputtered Co alloy thin films are used as recording media for high recording density in recent years. It has been well known that Co/Cr multilayer thin films is accepted as a possible medium for perpendicular magnetic recording because of its high perpendicular magnetic anisotropy. The effect of heat treatment on perpendicular magnetic properties and crystallographic orientation of Co/Cr and Co/Mo multilayer thin films was investigated. Multilayer thin films were identified by using low angle XRD analysis. The structure of films with thicker Co layers than Cr and Mo layers are found to be a hcp structure with c-axis normal to film plane. There is indication for interdiffusion between Co and Cr or Mo after heat treatment. Perpendicular coercivity was decreased after heat treatment. This decreases in perpendicular coercivity may be resulted from interdiffusion at interface of Co and Cr or Mo.

### P-112

#### THE ROLE OF LUBRICANT AND CARBON OVERCOAT TO CORROSION BEHAVIOR OF MAGNETIC RIGID DISK, N. C. CHO, J. H. WOO and I. T. NAM (Dept. of Mat. Sci. and Eng., Kangwon National Univ., Chunchon, 200-701, Korea.

Recent trends in magnetic recording show high recording density and faster data transfer rate using smoother disk surface, higher spindle rotation, and low flying height. The improvement of surface smoothness is essential for decrease in flying height between hard disk and head. The role of carbon overcoat and lubricant to tribological performance and corrosion behavior is important for disk drive durability. Lubricant and carbon overcoat effect on corrosion behavior are investigated by electrochemical test, corrosion chamber test and surface analysis method. Tribological performance was evaluated with CSS test. The chemical state change of carbon with XPS was analyzed. The effect of N<sub>2</sub> and H<sub>2</sub> gas mixture with Ar gas during carbon sputtering on corrosion behavior is also investigated. It is found that Co migration and corrosion were occurred along texture pattern. The corrosion characteristics was changed with N<sub>2</sub> and H<sub>2</sub> gas concentration. Saturation magnetization was reduced after corrosion test.