

고밀도 자기 기록매체용 Cr/CoCrGd/Cr 다층 박막의 자기적 성질

황경록 · 조완식 · 김종오

충남대학교 재료공학과

Magnetic properties of Cr/CoCrGd/Cr thin films for high density magnetic recording

Kyung-Rok Hwang, Wan-Sik Cho, Chong-Oh Kim

Dept. of Material Science & Engineering, Chungnam University

Longitudinal thin film metal media for a recording density 10 Gbit/in<sup>2</sup> require high coercivity( $H_c$ ) in the range from 2500 to 4500 Oe, and lower media noise levels. Also, to attain the recording density as permanent magnetic phases, which has high coercivity and large magnetic anisotropy suitable for the recording film media. Cr thin films are commonly used as an underlayer for Co-alloy films in hard disk application, since an underlayer of nonmagnetic polycrystalline Cr helps to, 1) increase coercivity by controlling grain size and morphology, 2) promotes in-plane orientation of the c-axis of hexagonal Co-alloy films, and 3) reduces media noise by controlling a magnetically isolated or voided microstructure. Cr films are also used as an overlayer for CoGd films, since a Cr layer conserves the magnetic stability of magnetic layer. Research into CoCrGd film is new, but recently CoCrX(X=Ta, Ti)/Cr film has been proposed to be one of promising candidates as a high density magnetic recording media.

In order to obtain high  $H_c$  for ultrahigh density recording media, the microstructures and magnetic properties of Cr/CoCrGd/Cr were studied. Heat treatment was attempted to improve the crystallinity of GdCo alloy, which has a high magnetic anisotropy, in CoCrGd film.

The magnetic properties and microstructures of Cr/CoCrGd/Cr multilayers were grown by using a R.F. magnetron sputter device. The Cr underlayer was introduced to control the morphology of CoCrGd magnetic layer and the Cr overlayer provided the magnetic stability against atmospheric degradation.