

OXYGEN PARTIAL PRESSURE DEPENDENCE OF THE COERCIVITY OF SPUTTERED POLYCRYSTALLINE NICKEL FERRITE FILMS

P. SAMARASEKARA

Department of Physics, University of Ruhuna, Matara, Sri Lanka

E mail: pubudus@phy.ruh.ac.lk.

ABSTRACT

The magnetic properties and structural properties of rf sputtered polycrystalline nickel ferrite ($\text{NiO}:\text{Fe}_2\text{O}_3$) films were investigated. The change of coercivity with the oxygen partial pressure during sputtering is reported in this paper. The coercivity drastically increased from 355 to 1100 Oe as the oxygen partial pressure in the chamber was increased from 6 to 24 mTorr. These films were sputtered on polycrystalline Al_2O_3 substrates in a mixture of argon gas and oxygen gas at one chosen deposition temperature. Since the coercivity depends on the deposition temperature, these films were deposited at one particular deposition temperature. These kinds of ferrimagnetic films with higher coercivities are useful in high-density magnetic recording media.

Keywords: Nickel ferrite films, Magnetic & structural properties, Oxygen partial pressure, rf sputtering, thin films, soft ferrites, coercivity, crystallites