

Characteristic investigation of sputtered Co-Cu films on glass substrate

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A series of sputtered Co_x-Cu_{100-x} films with different compositions (x = 88, 76, 65, 52, 38 and 34) were prepared by RF-sputtering process on glass substrate under 10⁻³ mbar of Ar pressure. XRD results presented both of Co (FCC) and Cu (FCC) phases in (111) plane at $2\theta = 44.23^\circ$ and 43.34° , respectively. The intensity of Cu peaks was increased likewise the intensity Co peaks was decreased with increasing Cu composition. Morphology of all deposited films showed the columnar structures. The maximum and minimum surface roughness was observed on Co₃₈Cu₆₂ and Co₈₈Cu₁₂ films, respectively. At the temperature of around 600°C, DTA curves showed endothermic peak representing oxidation reaction of Co and Cu phases. Magnetic properties were investigated by MOKE technique under an applied magnetic field from -44.59 to 44.59 mT. The Co₈₈Cu₁₂, Co₇₆Cu₂₄ and Co₆₅Cu₃₅ films exhibited ferromagnetic phase whereas the Co₃₈Cu₆₂ and Co₃₄Cu₆₆ films showed paramagnetic phase. The maximum coercivity of about 15.1 mT and the minimum of about 1.7 mT were observed on Co₈₈Cu₁₂ and Co₅₂Cu₄₈ films, respectively. It can be concluded that the composition strongly effects on structure, morphology and magnetic properties of the films.

Primary author: Ms SOMBOONSAP, Suthasinee (Kasetsart University)

Co-author: Ms RATTANASAKULTHONG, Watcharee (Kasetsart University)

Presenter: Ms SOMBOONSAP, Suthasinee (Kasetsart University)

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