

Effect of Heat Treatment on Properties of Sputtered Co_{100-x}Cu_x Film

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Granular Co_{100-x}Cu_x films with the different compositions of $x = 19, 40, 54, 65$ and 76 were prepared on glass substrate by RF-sputtering technique. After deposition, the films were annealed for 30 min at temperature of 400°C in Argon atmosphere. XRD result confirmed that the as-deposited films showed Co (220) and Cu (111) phases and annealed films showed Co₃O₄ (3 1 1) and CuCoO (3 1 1) phases. AFM results revealed the dependence of surface morphology on the film composition and heat treatment because of the difference of the deposition and segregation rate of Co and Cu atoms. The magnetic properties from VSM showed that Co₈₁Cu₁₉ film annealed at 400°C exhibited a perpendicular magnetic anisotropy. The saturation magnetization does not only depend on magnetic composition but also rely on annealed temperature. It can be concluded that the desirable surface morphology and magnetic properties of sputtered Co-Cu film can be controlled by an appropriate heat treatment and composition.

Keywords: Co-Cu film, Sputter deposition, Heat treatment, Magnetic properties

Primary author: Mr CHALOEIPOTE, Gun (Department of Physics, Faculty of Science, Kasetsart University)

Co-author: Dr RATTANASAKULTHONG, Watcharee (Department of Physics, Faculty of Science, Kasetsart University)

Presenter: Mr CHALOEIPOTE, Gun (Department of Physics, Faculty of Science, Kasetsart University)

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