Magnetoresistance effect of Cu/Cu-Co hybrid multilayer films

ABSTRACT

A series of hybrid multilayers of CuCo/Cu had been fabricated using RF magnetron sputtering technique. Investigation on film's surface morphology, structural and magnetoresistance properties had been carried out using atomic force microscope (AFM), X-ray diffraction (XRD) and four-point probe method. AFM image show that Cu layer consist of uniform size of particles size distribution. However, the CuCo show broad particles size distribution. XRD spectrum shows that both Cu and CuCo layers is Cu(111), Cu(200) and Cu(220) oriented with the formation of Cu(111) structure is dominant. The GMR ratio for all sample are small. The highest GMR value of -0.6% is obtained for sample with 5 layers. It is believed to be due to the formation of superparamagnetic particles in the sample that needed higher magnetic field to saturate it. The results also show that number of layer did not influence much to improve the GMR value.

Keyword: Cu/Cu-Co; Magnetoresistance; GMR; Multilayer films