

عنوان مقاله:

CHARACTERIZATION OF CO-FE MAGNETIC FILMS FABRICATED BY GALVANO-STATIC
ELECTRODEPOSITION

محل انتشار:

مجله علم مواد و مهندسی ایران، دوره 14، شماره 2 (سال: 1396)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

In this research, nanocrystalline Co-Fe coatings were electrodeposited on copper substrate. The influence of current density on different properties of the films at two pH levels was investigated. All the coatings showed nodular structure with rougher morphology at higher current densities. Due to anomalous deposition at higher current density, the amount of iron content increased and reached its maximum value at about 50 wt.% for the coating obtained from pH 5. X-ray diffraction patterns showed hcp structure as the dominant phase. However, by increasing current density at lower pH value, a double phase structure containing fcc+hcp phases was detected. It was observed that current density has a positive effect on grain refinement. However, coarser grains would obtain at lower pH value. Microhardness measurements showed that, there is a direct relationship between grain size and microhardness. Moreover, microstructure in double phase structure films can influence microhardness more dominantly. Vibrating sample magnetometer (VSM) measurements indicated that the saturation magnetic is proportion to deposited iron content and reached its maximum value at about 1512 emu/cm³. It was cleared that grain size, phase structure and chemical composition can affect coercivity of the films effectively.

کلمات کلیدی:

Co-Fe, Current density, Microstructure, Microhardness, Magnetic property

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