Roughness, Hardness and Giant Magneto Resistance of Cu/Co Multilayers Prepared by Jet electrochemical deposition

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Cu/Co multilayer film was prepared on a Si substrate using a translational jet electrochemical deposition system. A scanning electron microscope, X-ray diffractometer, a 3D surface profilometer, a digital microhardness tester, and a physical property measurement system were used to characterize the surface topography, microtexture, roughness, microhardness, and giant magnetoresistance respectively. It was found that the surface morphology of the multilayer improved and the interface between the Cu and Co layers was well-defined. The roughness and hardness of the multilayer are superior to those of single metal film. The Cu/Co multilayer exhibited an excellent giant magnetoresistive ratio of 50.38%. The giant magnetoresistance increased with the increase in the multilayer cycle number and decreased when the cycle number exceeded 120. The multilayer prepared by this method has high sensitivity to magnetoresistive change and it is easy to control the multilayer's resistance.

Keywords: jet electrochemical deposition; Cu/Co multilayer; Giant Magnetoresistance

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