

Properties of Cu/chromium-nickel steel multilayers made by PVD methods

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The magnetic properties of multilayers Cu/Ni are known because of their giant magnetoresistance effect. Under conditions of elevated temperature and diffusion between the components of multilayers their magnetic properties, such as magnetoresistance, decrease. In this work the chrome-nickel steel (AISI310S) was used as the ferromagnetic material in the multilayers. Austenitic chromium-nickel steel after the magnetron sputtering and deposition onto Si-substrate has structure of ferrite. Ferritic structure is stable up to about 500degC. It can be assumed that due to the complex chemical composition of the steel components the mutual diffusion at the boundary interfaces could be slower than in Cu/Ni multilayers, and thus the multilayer retain their magnetoresistance in a wider temperature range. The AFM, X-ray and VSM investigation of Cu/CrNi steel multilayers with 50-150 bilayers were presented in the paper.