Microstructural Study of Thin Films CuFe Obtained by ThermalEvaporation of Nanostructured Milled Powde

H. Mechri, A. Haddad, M. Zergoug, M. Azzaz

Abstract: Commercial copper and iron powders were used as starting materials. These powderswere mechanically alloyed to obtain Cu(100-x) Fex supersaturated mixture. The milling duration waschosen in such a way as to obtain a nanostructured mixture and to form a supersaturated solidsolution of CuFe; the powder mixture was used to deposit CuFe on a glass substrate. The elaboration of our films has been carried out using thermal evaporation process (physical vapordeposition) under $1 \times 10-6$ mbar vacuum from an electrically heated tungsten boat, using thesupersaturated solid solution Cu(100-x) Fex powder obtained by mechanical alloying. The filmsdeposition has been done on glass substrates. In this study, we present the composition effect on thestructural and magnetic proprieties of Cu(100-x) Fex powder and thin films. The chemicalcomposition, structural and magnetic proprieties of milled powders and thin films were examined SEM, TEM, XRD, XRF and VSM.

Keywords : thin film, CuFe Solid Solution, microstructure, DRX, MET, VSM