

Microstructural Study of Thin Films CuFe Obtained by Thermal Evaporation of Nanostructured Milled Powde

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Abstract: Commercial copper and iron powders were used as starting materials. These powders were mechanically alloyed to obtain Cu(100-x) Fe_x supersaturated mixture. The milling duration was chosen in such a way as to obtain a nanostructured mixture and to form a supersaturated solid solution 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 vapor deposition) under 1×10^{-6} mbar vacuum from an electrically heated tungsten boat, using the supersaturated solid solution Cu(100-x) Fe_x powder obtained by mechanical alloying. The film deposition has been done on glass substrates. In this study, we present the composition effect on the structural and magnetic properties of Cu(100-x) Fe_x powder and thin films. The chemical composition, structural and magnetic properties of milled powders and thin films were examined by SEM, TEM, XRD, XRF and VSM.

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