

Paper Title:

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

#### Abstract

Commercial copper and iron powders were used as starting materials. These powders were mechanically alloyed to obtain  $\text{Cu}_{(100-x)}\text{Fe}_x$  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  $1 \times 10^{-6}$  mbar vacuum from an electrically heated tungsten boat, using the supersaturated solid solution  $\text{Cu}_{(100-x)}\text{Fe}_x$  powder obtained by mechanical alloying. The films deposition has been done on glass substrates. In this study, we present the composition effect on the structural and magnetic proprieties of  $\text{Cu}_{(100-x)}\text{Fe}_x$  powder and thin films. The chemical composition, structural and magnetic proprieties of milled powders and thin films were examined by SEM, TEM, XRD, XRF and VSM.

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