

STRUCTURAL AND MAGNETIC PROPERTIES OF NANOSTRUCTURED Fe₈₀Co₂₀ POWDERS ELABORATED BY MECHANICAL ALLOYING PROCESS.

YOUNES Abderrahmane, ZERGOUG Mourad, OUBOUCHOU Hassane, Bacha Nacereddine

Abstract : Nanostructured disordered iron–cobalt alloy of Fe–80% Co–20% composition was prepared by mechanical alloying of the elemental powders in a high-energy ball milling. The transformations occurring in the material during milling were studied with the Eddy current characterization for having the relationship with impedance, lattice parameters and crystallite size. The transformation of the phase depends upon the milling time. With the increase of milling time all Co atoms became dissolved in the bcc Fe and the final product of the MA process was the nanocrystalline Fe (Co) solid solution with a mean crystallite size of about 15 nm. Scanning electron microscopy (SEM) was employed to examine the morphology of the samples as a function of milling times. Magnetic properties were investigated and related to the microstructural changes.

Keywords : Mechanical Alloying, Nanostructure materials, Eddy Current, Magnetic and mechanical properties