Magnetic and structural Behavior of Fe-CoO Nanocomposites Mechanically Milled

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Abstract: The Fe60(CoO)40 nanostructured alloys have been prepared from pure iron and cobaltoxide powders by mechanical alloying technique within a high energy planetary ball-mill.Morphology, microstructural and magnetic properties of this powder were investigated by aScanning Electron Microscope (SEM), X-ray diffraction (XRD) and Vibrating samplemagnetometer (VSM). The effect of time of milling on magnetic behaviour of Fe(CoO)nanostructured composite has been investigated. Apparition of new phase polycrystallinesample having a size in the range of 12 and 26 nm, it is confirmed by X-ray diffraction testing. The enhanced magnetic properties and structural behaviour of the nanoparticle are due by the diminution of size of crystallite. After 40 hours of milling, the appearance of spinel structure CoFe2O4. The reduction in particle size leads to a significant increase in magnetichardening, the coercive field at room temperature increases from 6 Oe to 208 Oe

Keywords : Fe60(CoO)40 nanostructured alloys, Mechanical Alloying, Magnetic Properties