Micro & Nano Letters

Volume 13, Issue 7, 2018, Pages 974-978

Structure, magnetic and microwave studies of mechanically alloyed powders Fe45Ni35Co20

Ahmed HADDAD, Insaf Ouldbrahim, Mohamed Azzaz

Abstract: Nanocrystalline Fe-35 wt%Ni-20 wt%Co has been prepared by using a high-energy planetary ball mill with increasing milling time from 4 to 36 h. Microstructural characterisations showed the development of an face-centred cubic nanostructured Fe-35 wt%Ni-20 wt%Co alloy with an average crystallite size of 8 nm. The magnetic investigation revealed that the nanostructures obtained from a milling time of 36 h have the highest magnetic saturation and the lowest coercive field. In addition, the hardness and the electromagnetic absorption of the Fe-35 wt%Ni-20 wt%Co alloy were found to increase with the milling time. These evolutions could be attributed to the crystallite size and the strain variations in the samples during milling.

Keywords : nanostructure, magnetic, nanocristalline, Mechanical Alloying, Fe, Co