

MAGNETIC, MICROWAVE AND ABSORBING PROPERTIES Fe-Co OF ALLOY SYNTHESIZED BY MECHANICAL ALLOYING PROCESS

S. Bergheul, A. Haddad, H. Tafat, M. Azzaz

Abstract : Nanocrystalline Fe(1-x) Co_x mixtures have been prepared by mechanical alloying using a planetary ball mill under several milling conditions. Their structures and magnetic properties were investigated. Mechanical alloying is a non-equilibrium process for materials synthesis. The structural effects of mechanical alloying of powders were investigated by scanning electron microscopy, X - Ray diffraction analysis and bench of microwaves. Consequently, the alloy powder with average grain size 10-13 nm was obtained. Maximum saturation magnetization M_s was obtained at the composition of 65 % Co. Microwave measurements were performed on the mechanically milled Fe(1-x) Co_x powder. It has been shown that fine nanocrystalline Fe-Co alloy powders prepared by mechanical milling are promising for microwave applications.

Keywords : Fe-Co powder, Mechanical Alloying, Magnetic Properties, Microwave