Hysteresis Behavior and Microstructure in Nanostructured Alloys Cu-Fe and Cu-Fe-Co

Authors : Laslouni Warda, M. Azzaz

Abstract : The intermetallic-based on transition metal compounds present interesting magnetic properties for the technological applications (permanent magnets, magnetic recording...). Cu70 Fe18Co12 and Cu70 Fe30 nanostructured with crystallite size vary from 10 a 12 nanometers have been developed by a mechanical milling method. For Cu-Fe samples, the iron and copper distribution was clear. The distribution showed a homogeneous distribution of iron and copper in a Cu-Fe obtained after 36 h milling. The structural properties have been performed with X-ray diffraction. With increasing milling times, Fe and Co diffuse into the Cu matrix, which accelerates the formation of the magnetic nanostructure Cu-Fe-Co and Cu-Fe alloys. The magnetic behavior is investigated using Vibrating Sample Magnetometer (VSM). The two alloys nanocrystals possess ferromagnetic character at room temperature

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Keywords : Cu-Fe-Co, Cu-Fe, nanocrystals, SEM, hysteresis loops, VSM, anisotropy theory

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