

Soft magnetic behaviour in amorphous and nanocrystalline $\text{Fe}_{73.5-x}\text{Mn}_x\text{Si}_{13.5}\text{B}_9\text{Nb}_3\text{Cu}_1$ ($x=1, 3, 5$) alloys

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Abstract: Amorphous ribbons $\text{Fe}_{73.5-x}\text{Mn}_x\text{Si}_{13.5}\text{Nb}_3\text{Cu}_1$ ($x=1, 3, 5$) were prepared by rapid quenching on a single rotated copper wheel. The X-ray patterns show that the as-cast samples are amorphous. The measurements of thermomagnetic curves indicated that the Curie temperature of the amorphous phase of the samples decreased with increasing Mn content. The optimal heat treatment was performed at $T_a=535^\circ\text{C}$ for 1 h and showed that the ultrasoft magnetic properties of nanocomposite materials were obtained. The frequency dependence of magnetoimpedance was measured in the frequency range of 1-10 MHz and at a fixed current of 10 mA. The correlation between the MI effect and the soft magnetic properties is discussed. ?? 2006 Elsevier B.V. All rights reserved.

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