

INFLUENCE OF COMPOSITION IN THE CRYSTALLIZATION PROCESS OF $\text{Fe}_{75-x}\text{Nb}_{10}\text{B}_{15+x}$ AMORPHOUS ALLOYS

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The devitrification process of $\text{Fe}_{75-x}\text{Nb}_{10}\text{B}_{15+x}$ ($x=0,5,10$) amorphous alloys produced by melt-spinning has been analysed by calorimetric, microstructural and measurements. The experimental results show large differences in the behaviour of these alloys as a function of composition. The alloy $x=0$ undergo a primary crystallization process separated in two stages while only one is observed for alloys with $x=5$ and $x=10$. This difference, observed by DSC, is correlated with a microstructural change in the phases that precipitate. For alloys $x=5$ and 10 Fe_{23}B_6 and bcc-Fe are identified after the first calorimetric peak. In the sample $x=0$ bcc-Fe and an unidentified phase precipitate in the first peak but massive crystallization of bcc-Fe is observed after the second stage. The results of phase quantification by Rietveld refinement process from XRD patterns of fully crystalline samples are obtained and compared to those predicted by ternary phase diagrams. Finally magnetic properties as saturation magnetization and Curie temperature for the amorphous alloys after the first crystallization process are determined. The change of these quantities with heat treatment and composition is discussed.

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Topic II. Crystallization phenomena and structural properties.

