Crystallization, magnetic and magnetoimpedance properties of a $Fe_{84.5}Zr_2Nb_4B_{8.5}Cu_1$ nanoperm ribbon

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Abstract: An amorphous ribbon of $Fes_{4.5}Zr_2Nb_4B_{8.5}Cu_1$ has been prepared by single-roll melt spinning in an Ar atmosphere. The crystallization process studied by differential scanning calorimetry (DSC) is in agreement with that in the Kissinger model and the Johnson-Mehl-Avrami (JMA) model. The magnetoimpedance ratio (MIR) of the ribbon has been measured to investigate the influence of the structural transformation in the crystallization process and the changes of the soft magnetic properties after thermal treatment. The magnetoimpedance (MI) of these samples has been studied in the frequency range from 1 MHz to 5 MHz by varying a dc magnetic field within 300 Oe. A maximum MI ratio of up to 85 % has been observed for ribbons annealed at 530 ?C for 40 min around a frequency of 1 MHz. The incremental permeability ratio (PR) shows drastic changes in soft magnetic properties as a function of the annealing temperature.

Author Keywords: Amorphous alloys; Nanocrystalline materials; Ultrasoft nanocomposite

Year: 2008
Source title: Journal of the Korean Physical Society
Volume: 52
Issue: 5
Page : 1390-1393
Cited by: 1
Link: Scorpus Link
Correspondence Address: Nguyen, Q. H.; BK21 Program, Department of Physics, Chungbuk National University, Cheongju 361-763
ISSN: 3744884
Language of Original Document: English
Abbreviated Source Title: Journal of the Korean Physical Society
Document Type: Article
Source: Scopus
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