

**Application of the coupling model to magnetic after effects
in the $\text{Fe}_{72}\text{Co}_{10}\text{Nb}_6\text{B}_{12}$ amorphous alloy**

A. Chrobak¹, G. Haneczok², P. Kubik², L. Madej², G. Chełkowska¹

¹) Institute of Physics, University of Silesia, 40-007 Katowice, 4 Uniwersytecka, Poland

²) Institute of Materials Science, Univ. of Silesia, 40-007 Katowice, 12 Bankowa, Poland

The aim of the present paper is to study free volume diffusion in the $\text{Fe}_{72}\text{Co}_{10}\text{Nb}_6\text{B}_{12}$ amorphous alloy via measuring magnetic reluctivity versus time after demagnetization for samples pre-annealed at elevated temperatures. Such annealing changes the sample microstructure and allows studying the progress in structural relaxation. Measurements were carried out at room temperature in weak magnetic field (0.5 A/m). According to the Neel approach reluctivity $r(t)$ for a non-interacting system represents a simple exponential relaxation. In order to describe the observed non-exponential process we have generalized the Neel formalism by applying the so-called coupling model (universal response function) appropriate for strongly correlated systems. Numerical analysis of the experimental curves shows that with increasing annealing temperature the relaxation intensity, the relaxation time and the coupling parameter decrease monotonically. This result is in agreement with the idea of formation of thermally stable relaxed amorphous phase containing small iron clusters.

9.7 cm

13.4 cm

Subject category :

6. Soft and Hard Magnetic Materials

Presentation mode :

poster

Corresponding author :

A. Chrobak

Address for correspondence :

Institute of Physics, University of Silesia,
40-007 Katowice, 4 Uniwersytecka,
Poland

Email address :

appel@chello.pl