JOULE HEATING PREANNEALING EFFECT IN THE COERCIVITY FIELD AND MAGNETOSTRICTION CONSTANT OF $Co_{66}Fe_4Mo_2Si_{16}B_{12}$ ALLOY

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9.7 cm

Amorphous Co-based alloys are generally near zero-magnetostrictive materials. Their magnetic properties present normally a high sensitivity to structural defects as regions of lower or higher density becoming the sources of compressive or tensile internal stresses and influencing the domain structure and indirectly the magnetization process. In this work we present the effect of preanealing by Joule heating in samples of nominal composition $Co_{66}Fe_4Mo_2Si_{16}B_{12}$. After heat treatment X-ray diffraction and TEM studies were made showing that the microstructure of the samples was formed by nanocrystalline grains of Co (12 nm) embeded in an amorphous residual matrix. Magnetic measurements under applied tensile stresses in the range 300 to 700 MPa permitted to show the variation of the coercive field and magnetostriction constant with that parameter in the treated samples and make comparison between preannealed and non preannealed ones. It could be observed very low remarkable values of the magnetostriction constant for some of the treated samples ($\lambda_S = -3.87 \times 10^{-8}$ for the sample treated at 1.2 A by 30 min) which permits to obtain good candidates for future technological applications.

13.4 cm

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