EFFECT OF EXTERNAL MAGNETIC FIELD ANNEALING ON MAGNETIC TEXTURE OF Mo-CONTAINING NANOPEM-TYPE NANOCRYSTALLINE ALLOYS

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External magnetic fields are known to modify microstructure of materials during their solidification and/or crystallisation. In an external magnetic field strong particle to particle interactions lead to a highly anisotropic microstructure. If the alloy is in ferromagnetic state, stronger particle magnetization – external field interactions and also particle-to-particle couplings are expected. To reveal the magnetic texture, originally amorphous precursors of $Fe_{76}Mo_8Cu_1B_{15}$ were annealed at 510°C and 550°C in an external longitudinal and transverse magnetic field of 0.025 T and 0.8 T, respectively. Magnetic measurements were applied to follow the changes of saturation magnetization and coercive force. Mössbauer experiments were performed at room and liquid nitrogen temperature (LNT) to provide an information about orientation of with respect to an external magnetic field. The obtained results were compared with those achieved on zero field annealed samples. We can conclude that such a low external magnetic fields applied during crystallisation cause no significant changes in the magnetic microstructural anisotropy. Afterwards, magneto-optical Kerr effect (MOKE) was applied to investigate possible changes at the surface of the ribbon as a function of annealing temperature and applied magnetic field. We observed combination of uniaxial anisotropy, which originates from the shape anisotropy, and four-fold anisotropy, which is a contribution from crystallites of nanometre size embedded in the residual amorphous matrix. We expect more pronounced effects on cobalt substituted $(Fe_{1-x}Co_x)_{76}Mo_8Cu_1B_{15}$ alloy.

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