

Effect of temperature and time annealing under applied stresses on magnetic properties of amorphous microwires

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Amorphous ferromagnetic glass coated microwires (MWs) are one of the most perspective materials for coding system and memory applications [1]. For successful implementation of these devices it is necessary to control MWs magnetic properties and domain wall dynamics. In this work we investigated the effect of annealing under tensile applied stress on magnetic properties of amorphous MWs with compositions of $\text{Co}_{68,6}\text{B}_{14,8}\text{Si}_{10}\text{Mn}_{6,6}$, $\text{Co}_{68,7}\text{Fe}_4\text{Ni}_1\text{B}_{13}\text{Si}_{11}\text{Mo}_{2,3}$ and $\text{Fe}_{3,85}\text{Co}_{67,05}\text{Ni}_{1,44}\text{B}_{11,53}\text{Si}_{14,47}\text{Mo}_{1,66}$. Samples of MWs were annealed at temperatures of 300-400 ° C during different times up to 90 min with different applied stresses up to 300 Pa. We observed changing of the magnetic properties depending on all parameters of annealing. Some conditions of annealing lead to appear of bistability and possibility to observe the domain wall movement with high velocity. Besides, it was shown that MWs with acquired bistability can be more useful for applications than originally bistable.

References:

[1] Zhukov A., Encyclopedia of Nanoscience and Nanotechnology, V.X.– P.23., (2004)