Magnetic Behavior of Amorphous FeCoB(Cu) Alloys after Low Stress Annealing

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Abstract. Amorphous alloys with composition $(Fe_{75}Co_{10}B_{15})_{100-x}Cu_x$ (x = 0, 0.7, 1 and 1.3 at. %) were successfully prepared by planar flow casting in air. The aim of the work was investigation of magnetic behavior of the samples after rapid annealing without and with low stress pressure applied during heat treatment. As-cast ribbons were analyzed by DSC measurements which have shown gradual decrease of the first crystallization reaction with increasing content of Cu. X-ray diffraction revealed resulting microstructure after annealing to be bcc-Fe(Co) phase for pressure-annealed alloys in Ar atmosphere while rapid annealing without pressure caused only the release of internal stresses and only minimal content of crystallinity. Pressure-annealing affected the deterioration of soft magnetic properties; however, the magnetic saturation of all pressure-annealed alloys increased. Results of this work point to the obvious influence of even low pressure-annealing on the resulting magnetic properties of magnetostrictive materials.