

Induced anisotropy and domain structure in field-annealed Co-rich nanocrystalline ribbons

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In this work, a controllable field-induced magnetic anisotropy is produced in series of $(\text{Co}_{1-x}\text{Fe}_x)_{81}\text{Nb}_7\text{B}_{12}$ ($x=0, 0.05$ and 0.1) alloys with different amount of crystalline phase. We show that nanocrystallization of the parent amorphous melt-spun ribbons in a longitudinal (LF) or transverse (TF) magnetic field with the magnitude 640 kAm^{-1} is very powerful tool to tailor the shape of the hysteresis loops and to control the domain structure of these materials. Heat treatment under LF-conditions results in squared hysteresis loops, which are accompanied by an appreciable reduction of the coercivity as compared to zero-field annealed samples. Sheared loops with good field linearity were achieved for all investigated alloys after TF-annealing. A marked response of the functional properties of these alloys to thermal processing in external magnetic field can be utilized in their better adaptation to potential applications.