Magnetic behaviour in melt-spun amorphous $Fe_{81-x-y}Ni_xCo_yZr_7B_{12}$ alloys

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Amorphous melt-spun ribbons of NANOPERM and HITPERM-type of the chemical composition of $Fe_{81-x-y}Ni_xCo_yZr_7B_{12}$ (x = 0-81, y = 0 and x = 0, y = 0-81) have been studied by means of thermomagnetic measurements (TMAG) and differential scanning calorimetry (DSC). Magnetization saturation, Curie temperatures and changes in the magnetization behaviour with temperature have been determined and the results have been compared with literature data for the $Fe_{86-x-y}Ni_xCo_yZr_7B_6Cu_1$ (x = 0-86, y = 0 and x = 0, y = 0-86) [1, 2]. The TMAG results are complemented with the DSC measurements to get a detailed characterization of the crystallization behaviour.

On crystallisation the appearance of new metastable phases in the form of nanocrystalline grains has been observed. One of such metastable phases is $Cr_{23}C_6$-type whose appearance strongly depends on the alloying additions [3]. Therefore, the properties of the amorphous starting state are important for a consequent comparison with later nanocrystalline and fully crystalline states of the alloys tested as well as for possible engineering application.

The Curie temperature dependence on the Ni content in our ribbons is qualitatively similar to that of conventional crystalline Fe-Ni alloys, *i.e.* exhibits a maximum at 352°C for x = 40 and y = 0 and has a bell-type shape. Alloys with Co additions show an increase in the Curie temperature and for x = 0, $y \geq 40$ the crystallization starts before the transition into paramagnetic state. Saturation magnetization of all samples decreases with increasing Ni or Co additions.

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