

STRUCTURE AND MAGNETIC PROPERTIES OF $\text{Fe}_{11}\text{Ni}_{70}\text{Zr}_7\text{B}_{12}$ ALLOY

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Structure and magnetic properties of melt-spun $\text{Fe}_{11}\text{Ni}_{70}\text{Zr}_7\text{B}_{12}$ alloy have been studied by means of X-ray diffraction (XRD), vibrating-sample magnetometry (VSM), differential scanning calorimetry (DSC) and Mössbauer spectroscopy (MS). The aim of the present paper is an investigation of the influence of Cr_{23}C_6 -type phase appearance on magnetic properties of FeNi based alloys. Melt-spun sample crystallizes into metastable $(\text{FeNi})_{23}\text{B}_6$ structure at 450°C with probable *fcc*-austenite as the additional phase. Structure identification by XRD is complicated because of overlapped positions of austenite and metastable boride Bragg picks. Magnetization in amorphous $\text{Fe}_{11}\text{Ni}_{70}\text{Zr}_7\text{B}_{12}$ alloy is about $12 \text{ Am}^2/\text{kg}$ at 300 mT external field and is induced by Ni atoms. From the shape of hysteresis loop one may conclude about the existence of paramagnetic and ferromagnetic components. For isothermally annealed (640°C for 1 hour) sample magnetization value increases. This is connected with crystallization process and occurs due to incorporation of Fe atoms into crystalline phase. According to MS measurements annealed sample contains only 13 percent of paramagnetic fraction.