

**STRUCTURAL AND THERMAL PROPERTIES OF
AMORPHOUS $Gd_{65}Fe_{20-y}Co_yAl_{10}X_5$ ($X = Si, B, Al$) ALLOYS**

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GdFeAl-based amorphous or nanocrystalline alloys are subject of extensive investigations because of their promising application as new magnetic refrigerants. Amorphous $Gd_{65}Fe_{20-y}Co_yAl_{10}Si_5$ ($y = 5, 10, 15$), $Gd_{65}Fe_{10}Co_{10}Al_{10}B_5$ and $Gd_{65}Fe_{10}Co_{10}Al_{15}$ ribbons were prepared by melt-spinning method. The structural and thermal properties were investigated using X-ray diffraction (XRD) and differential scanning calorimetry (DSC). The XRD analysis revealed that as-quenched Gd-Fe-Co-Al-X ($X = Si, B, Al$) alloys possess amorphous structure. Two distinct diffuse diffraction peaks are visible. For some compositions additional peaks belonging to *hcp*-Gd grains are present, similarly as reported recently for Gd-Al-Mn system [1]. DSC curves were collected at different constant heating rates from 10 to 50 K/min. Crystallization temperatures T_x of Gd-Fe-Co-Al-X samples range from 290 to 340°C. Activation energies of crystallization E_a were calculated from the Kissinger relation. The thermal stability of amorphous phase was found to be highest for $Gd_{65}Fe_{10}Co_{10}Al_{15}$ alloy where E_a reaches 345 ± 20 kJ/mol. [1] S. Gorsse, B. Chevalier, G. Orveillon, Appl. Phys. Lett. 92 (2008) 122501