The crystallization, magnetic and magnetocaloric properties in $Fe_{76.5-x}Nb_xSi_{15.5}B_7Au_1$ ribbons

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Abstract: $Fe_{76.5-x}Nb_xSi_{15.5}B_7Au_1$ ribbons (x=0.0, 1.5, 3.0, 4.5) have been fabricated by rapid quenching technique. The DSC measurements indicated that both first exothermal peak T_{p1} (of ?-Fe(Si) phase) and second peak T_{p2} (of boride phase) as well as crystallization activation energy increase with increasing Nb content substituted, whereas saturation magnetization of samples decreases with x, due to ferromagnetic dilution. Besides, Curie temperature of amorphous phase decreases with x, i.e. Nb stabilizes amorphous structure of ribbons. The investigation of magnetic entropy change of studied samples showed that it may lead to magnetocaloric effect around respective Curie temperature of amorphous phase. ?? 2006 Elsevier B.V. All rights reserved.

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