

The substitution effect of Cr about large magnetocaloric effect in amorphous Fe-Si-B-Nb-Au ribbons

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Abstract: The magnetization behaviors have been analyzed for amorphous $\text{Fe}_{73.5-x}\text{Cr}_x\text{Si}_{13.5}\text{B}_9\text{Nb}_3\text{Au}_1$ ($x=0, 3, 5$) alloys. An amorphous phase was formed after quenching by melt spinning with a copper wheel surface speed of 30 m/s. The structure analysis of as-cast was performed using X-ray diffractometer. The magnetic properties of the ribbons were measured by VSM. The Curie temperature is decreased from 629 to 491 K with increasing Cr concentration ($x=0-5$). Temperature dependence of the entropy variation ΔSM was calculated from the isothermal magnetization. The maximum of ΔSM was found to appear in the vicinity of the Curie temperature of the amorphous phase. The ΔSM value is 1.7, 1.13 and 0.94 J/kg K at $x=0, 3$, and 5, respectively. © 2005 Published by Elsevier B.V.

Author Keywords: Amorphous ribbon; Isothermal magnetization; Magnetocaloric effect

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