The discovery of the colossal magnetocaloric effect in a series of amorphous ribbons based on Finemet

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Abstract: A large number of amorphous ribbons based on Finemet have been prepared by rapid quenching on a single copper wheel with linear speed of v = 25-30 m/s. The ribbons are 20-25 ?m thick and 6-8 mm wide. All as-cast samples are amorphous. Two criteria producing the colossal magnetocaloric effect (CMCE) in magnetic materials working as magnetic refrigerants are high saturation magnetization and sharp ferromagnetic-paramagnetic phase transition. The Fe-based amorphous ribbons fit these cretia. Thermomagnetic curves as well as isothermal magnetization curves around the Curie temperature of all the studied samples have been determined. The results show that the magnetic entropy change, $|??S_m|$, belongs to a class of materials with CMCE and the $|??S_m|_{max}$ values have been obtained at a moderately low magnetic field change of 1.35 T, moreover $|??S_m|_{max}$ occurred at quite high temperature. ?? 2006 Elsevier B.V. All rights reserved.

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