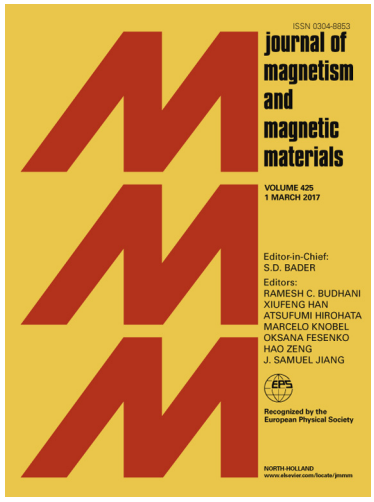

Research articles

Reversible magnetic-field-induced martensitic transformation over a wide temperature window in $Ni_{42-x}Co_xCu_8Mn_{37}Ga_{13}$ alloys

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Reversible magnetic-field-induced martensitic transformation over a wide temperature window in $Ni_{42-x}Co_xCu_8Mn_{37}Ga_{13}$ alloys

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Abstract

$Ni_{42-x}Co_xCu_8Mn_{37}Ga_{13}$ ($0 \leq x \leq 14$) alloys are reported to exhibit a magnetostructural transition from weakly-magnetic martensite to ferromagnetic austenite over a rather wide temperature window ranging from 200 K to 380 K. Simultaneously a large magnetization change $\Delta\sigma$ of up to 105 Am^2kg^{-1} is obtained at the martensitic transformation. A reversible magnetic-field-induced martensitic transformation is realized, resulting in a large magnetocaloric effect related to the high magnetic entropy change with a broad working temperature span. This work shows how it is possible to effectively tailor the magnetostructural transition in Ni-Mn-Ga alloys so as to achieve a reversible magnetic-field-induced martensitic transformation and associated functionalities.

***Keywords*:** Ferromagnetic shape memory alloys; Magnetic-field-induced martensitic transformation; Magnetocaloric effect