

Accepted Manuscript

Research articles

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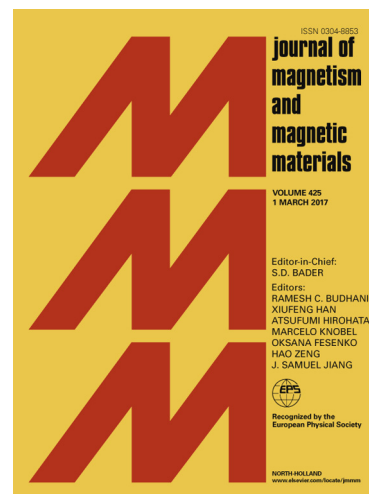
PII: S0304-8853(18)30055-6
DOI: <https://doi.org/10.1016/j.jmmm.2018.01.054>
Reference: MAGMA 63632

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 7 January 2018
Revised Date: 19 January 2018
Accepted Date: 21 January 2018

Please cite this article as: H. Hua, J. Wang, C. Jiang, H. Xu, Reversible magnetic-field-induced martensitic transformation over a wide temperature window in $\text{Ni}_{42-x}\text{Co}_x\text{Cu}_8\text{Mn}_{37}\text{Ga}_{13}$ alloys, *Journal of Magnetism and Magnetic Materials* (2018), doi: <https://doi.org/10.1016/j.jmmm.2018.01.054>

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Reversible magnetic-field-induced martensitic transformation over a wide temperature window in $\text{Ni}_{42-x}\text{Co}_x\text{Cu}_8\text{Mn}_{37}\text{Ga}_{13}$ alloys

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Abstract

$\text{Ni}_{42-x}\text{Co}_x\text{Cu}_8\text{Mn}_{37}\text{Ga}_{13}$ ($0 \leq x \leq 14$) 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 $105 \text{ Am}^2\text{kg}^{-1}$ 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

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