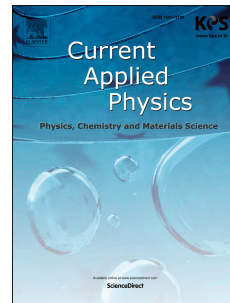


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Influence of crystallization treatment on structure, magnetic properties and magnetocaloric effect of $\text{Gd}_{71}\text{Ni}_{29}$ melt-spun ribbons

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Abstract: The influence of crystallization treatment on the structure, magnetic properties and magnetocaloric effect of $\text{Gd}_{71}\text{Ni}_{29}$ melt-spun ribbons has been investigated in detail. Annealing of the melt-spun samples at 610 K for 30 min, a majority phase with a Fe_3C -type orthorhombic structure (space group, $Pnma$) and a minority phase with a CrB-type orthorhombic structure (space group, $Cmcm$) were obtained in the amorphous matrix. The amorphous melt-spun ribbons undergo a second-order ferromagnetic to paramagnetic phase transition at 122 K. For the annealed samples, two magnetic phase transitions caused by amorphous matrix and Gd_3Ni phases occur at 82 and 100 K, respectively. The maximum magnetic entropy change $(-\Delta S_M)^{\max}$ is 9.0 J/(kg·K) (5T) at 122 K for the melt-spun ribbons. The values of $(-\Delta S_M)^{\max}$ in annealed ribbons are 1.0 and 5.7 J/(kg·K), corresponding to the two adjacent magnetic transitions.

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