

Influence of partial substitution of Fe by Mn on thermomagnetic properties of magnetocaloric $\text{LaFe}_{11.2}\text{Co}_{0.7}\text{Si}_{1.1}$ alloy

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The aim of the present work was to study the influence of partial substitution Fe by Mn in the $\text{LaFe}_{11.2-x}\text{Mn}_x\text{Co}_{0.7}\text{Si}_{1.1}$ (where $x=0.1, 0.2$ and 0.3) alloys. The master alloys were prepared by arc-melting of the high purity of constituent elements under low pressure of Ar. The obtained specimens were annealed in at 1323K for 15 days in sealed quartz tubes under low pressure of protective Ar gas. Magnetic properties of prepared samples were measured in the wide range of temperatures by Quantum Design MPMS-XL 5 equipped with 5T superconducting magnet. Measurements revealed that systematic increase of Mn in alloy composition resulted in decrease of the Curie temperature, which was correlated with of lattice parameter of the $\text{La}(\text{Fe},\text{Si})_{13}$ - type phase. For samples corresponding to Mn content $x=0.1$ and 0.2 decrease of magnetic entropy change was observed. However in the case of sample with $x=0.3$ the increase of magnetic entropy change was detected.

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