

Magnetism and magnetocaloric effect in $\text{La}_{1-y}\text{Nd}_y(\text{Fe}_{0.88}\text{Si}_{0.12})_{13}$ compounds

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Abstract: Structural and magnetic properties of $\text{La}_{1-y}\text{Nd}_y(\text{Fe}_{0.88}\text{Si}_{0.12})_{13}$ compounds have been investigated by means of X-ray diffraction and magnetization measurements. The single-phase NaZn_{13} -type cubic structure is stabilized for the compounds with $y = 0, 0.1, 0.3$ and 0.4 . All the synthesized compounds are ferromagnetic. Their Curie temperature T_C slightly increases with increasing Nd up to $y = 0.3$. The most striking effect of the Nd substitution, however, is in their itinerant-electron metamagnetic behavior and the magnetocaloric effect in the vicinity of T_C . The maximum entropy change decreases somewhat, but the relative cooling power increases with increasing Nd content (i.e. for $y = 0.3$). © 2003 Elsevier Science B.V. All rights reserved.

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