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Magnetic and magnetocaloric properties of $\text{La}_{0.6}\text{Ca}_{0.4-x}\text{Ce}_x\text{MnO}_3$

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$\text{La}_{0.6}\text{Ca}_{0.4-x}\text{Ce}_x\text{MnO}_3$ ($x = 0, 0.03, 0.06, \text{ and } 0.09$) compounds are fabricated by a solid-state reaction, and their structural, magnetic, and magnetocaloric properties are investigated. The Curie temperature at which a ferromagnetic–paramagnetic transition occurs decreases from 260 to 221 K as x increases from 0 to 0.09. The saturation magnetization also decreases with the increase of x . The experimental results for the magnetization with respect to the temperature and magnetic field are analyzed using the Banerjee criterion, revealing that all the samples undergo the second-order magnetic phase transition. The maximum magnetic entropy change measured at a magnetic-field span of 50 kOe, which occurs near the Curie temperature, slightly increases from 6.31 to 7.62 J/kg K as x increases from 0 to 0.09.

Keywords: Magnetocaloric effect, Magnetic properties, Perovskite manganites, Magnetic phase transformation.

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