

Influence of Cu doping on Magnetic and Magnetocaloric properties of $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.92}\text{Cu}_{0.08}\text{O}_3$

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We have studied the influence of Cu doping on the magnetic properties and the magnetocaloric effect of $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.92}\text{Cu}_{0.08}\text{O}_3$ prepared by using solid-state reaction. The temperature dependence of magnetization reveals that the presence of Cu dopant reduces the Curie temperature (T_C) to a value of ~ 165 K compared with parent compound $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ (~ 248 K). Based on magnetic-field dependences of magnetization, $M(H)$, we calculated the magnetic entropy change (ΔS_m), which reached a maximum ($|\Delta S_{\text{max}}| \approx 4.8$ J/ Kg K) around T_C corresponding to the relative cooling power (RCP) of 360 J/ kg under an applied field change $\Delta H = 50$ kOe. Additionally, based on Banerjee's criteria and universal curves of plotting the normalized entropy change as a function of the normalized temperature, we assess magnetic order existing in the sample. It was found that, the sample consists of second-order magnetic phase transition at magnetic field below 10 kOe and first-order magnetic phase transition at magnetic field above 10 kOe.