

# Mössbauer and Magneto Caloric Effect for $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.99}^{57}\text{Fe}_{0.01}\text{O}_3$

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**Abstract** The crystallographic and magneto caloric effects of  $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.99}^{57}\text{Fe}_{0.01}\text{O}_3$  powders were studied by using X-ray diffraction, vibrating sample magnetometer, and Mössbauer spectroscopy. To investigate the effect of sintering conditions on LCMO, the samples were sintered in air and evacuated sealed quartz tube. The calculated magnetic entropy change in the magnetic fields of 1.5 T for the samples which sintered in air and evacuated sealed quartz tube are 1.6 J/kg K and 3.2 J/kg K, respectively. The temperatures of the maximum slope in  $dM/dT$  for the samples which sintered in air and evacuated sealed quartz tube are 242 K and 262 K, respectively. For the explanation of the Mössbauer line broadening, we applied the presence the fluctuating magnetic field, which jumps between the values of hyperfine field,  $+H$  and  $-H$ , along the  $z$ -axis with a frequency  $f$ . We calculated anisotropy energy from Mössbauer relaxation analysis.

**Keywords** Magneto caloric effects · Mössbauer spectroscopy · LCMO · Anisotropy energy