

# Large magnetic-entropy change above room temperature in the colossal magnetoresistance $\text{La}_{0.7}\text{Sr}_{0.3}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ materials

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**Abstract:** Magnetic and magnetocaloric properties of the series  $\text{La}_{0.7}\text{Sr}_{0.3}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$  ( $x = 0.00, 0.01, 0.02, 0.03, \text{ and } 0.05$ ) have been investigated. The X-ray diffraction analysis shows that all perovskites studied have the rhombohedral structure. The field-cooled and zero-field-cooled thermomagnetic curves measured at low field show that there is spin-glass (or cluster-glass)-like state in the samples. It is found that the magnetic-entropy change  $|\Delta S_{\text{max}}|$  has reached the highest value of  $3.54 \text{ J/kgK}$  at  $13.5 \text{ kOe}$  for the composition with  $x = 0.02$ . ?? 2004 Elsevier B.V. All rights reserved.

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**Index Keywords:** Colossal magnetoresistance; Crystal structure; Entropy; Grain boundaries; Magnetic materials; Magnetic variables measurement; Magnetization; Nickel; Perovskite; Phase transitions; Scanning electron microscopy; X ray diffraction analysis; Magnetic refrigeration; Manganites; Perovskite manganites; Zero-field-cooled (ZFC) curves; Lanthanum compounds

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