

Some properties of La-deficient $\text{La}_{0.54}\text{Ca}_{0.32}\text{MnO}_{3-x}$

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Abstract: A La-deficient sample of $\text{La}_{0.54}\text{Ca}_{0.32}\text{MnO}_{3-x}$ was prepared by the solid-state reaction method. The Curie temperature T_C equals 300 K, which is significantly higher than those of the $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ system. The magnetic-entropy change reaches a maximum value of $\Delta S_M \approx 5.5 \text{ J/kg K}$ at the Curie temperature upon a 5 T magnetic field variation. A saturation magnetic moment $\mu_S = 2.99 \mu_B/\text{f.u.}$ at 5 K has been derived from the magnetization data. Values of 0.0230 and 0.441 for the oxygen deficiency x and the ratio of $\text{Mn}^{3+}/\text{Mn}^{4+}$, respectively, have been determined. From our study, it is suggested that this compound is a suitable candidate for application as a working substance in magnetic refrigeration. © 2003 Elsevier Science B.V. All rights reserved.

Author Keywords: La-deficient $\text{La}_{0.54}\text{Ca}_{0.32}\text{MnO}_{3-x}$, Magnetic-entropy change; Oxidation; Ratio $\text{Mn}^{3+}/\text{Mn}^{4+}$; Saturation moment

Index Keywords: Entropy; Magnetic fields; Magnetic moments; Magnetization; Solid state reactions; Lanthanum compounds

Year: 2003

Source title: Journal of Magnetism and Magnetic Materials

Volume: 262

Issue: 3

Page : 502-507

Cited by: 6

Link: [Scopus Link](#)

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Editors: Franse J.J.M. Duc N.H. Brommer P.R.

Conference name: Hanoi International Symposium

Conference date: 30 September 2002 through 30 September 2002

Conference location: Hanoi

Conference code: 61079

ISSN: 3048853

CODEN: JMMMD

DOI: 10.1016/S0304-8853(03)00085-4

Language of Original Document: English

Abbreviated Source Title: Journal of Magnetism and Magnetic Materials

Document Type: Conference Paper

Source: Scopus

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References:

1. Rao, C.N.R., Raychaudhuri, A.K., (1998) Colossal Magnetoresistance, Charge Ordering and Related Properties of Manganese Oxides, p. 3. , World Scientific Publishing Co. Pte. Ltd., Singapore
2. Ramirez, A.P., Schiffer, P., Cheong, S.W., Chen, C.H., Bao, W., Palstra, T.T.M., Gammel, P.L., Zegarski, B., (1996) Phys. Rev. Lett., 76, p. 3188
3. Bohigas, X., Tejada, J., Martinez-Sarrion, M.L., Tripp, S., Black, R., (2000) J. Magn. Magn. Mater., 208, p. 85
4. Pecharsky, V.K., Gschneidner, K.A.J., (1999) Magn. Magn. Mater., 200, p. 44
5. Fujishiro, H., Fukane, T., (2001) M. Ikebe. J. Phys. Soc. Jpn., 70 (3), p. 628
6. Rivas, J., Hueso, L.E., Fondado, A., Rivadulla, F., Lopez-Quintela, M.A., (2000) J. Magn. Magn. Mater., 221, p. 57
7. Sun, Y., Xu, X., Zhang, Y., (2000) J. Magn. Magn. Mater., 219, p. 183
8. Xu, Q.Y., Gu, K.M., Liang, X.L., Ni, G., Wang, Z.M., Sang, H., Du, Y.W., (2001) J. Appl. Phys., 90, p. 524
9. Chen, G.J., Chang, Y.H., Hsu, H.W., (2000) J. Magn. Magn. Mater., 219, p. 317
10. Guo, Z.B., Du, Y.W., Zhu, J.S., Huang, H., Ding, W.P., Feng, D., (1997) Phys. Rev. Lett., 78, p. 1142
11. Bohigas, X., Tejada, J., Del Barco, E., Zhang, X.X., Sales, M., (1998) Appl. Phys. Lett., 73, p. 390
12. Sinh, N.H., (2002) Proceedings of the Vietnam-Italy Seminar on Technology and Application of Advanced Ceramics, p. 64. , July

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