Spin glass-like behavior, giant magnetocaloric and giant magnetoresistance effect in PrPb manganites

Chau N., Hanh D.T., Tho N.D., Luong N.H.

Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam

Abstract: The $Pr_{1-x}Pb_xMnO_3$ (x=0.1-0.5) perovskites have been fabricated by solid-state reaction. The X-ray diffraction patterns show that the samples are of single phase with orthorhombic structure. The field-cooled (FC) and zero-field-cooled (ZFC) thermomagnetic curves measured at low field and low temperatures exhibit the spin glass-like state. The Curie temperature of samples increased with increase in Pb content. The maximum magnetic entropy change $|??S_m|_{max}$ reaches the giant values of 3.91 and 3.68 J/kg K for quite low magnetic field change of 1.35 T for the samples x=0.1 and 0.4, respectively. The resistance measurements show that there is insulator-metal phase transition on the R(T) curves for samples with x{greater than or slanted equal to}0.3. The giant magnetoresistance effect is also observed for all samples studied. ?? 2006 Elsevier B.V. All rights reserved.

Author Keywords: Magnetocaloric effect; Manganites; Spin glass-like state

Index Keywords: Entropy; Giant magnetoresistance; Magnetic field effects; Magnetic properties; Measurement theory; Metal insulator transition; Perovskite; Reaction kinetics; Spin glass; X ray diffraction analysis; Insulator-metal phase transitions; Magnetocaloric effects; Manganites; Spin glass-like states; Praseodymium compounds

Year: 2006

Source title: Journal of Magnetism and Magnetic Materials

Volume: 303

Issue: 2 SPEC. ISS.

Cited by: 5

Link: Scorpus Link

Correspondence Address: Chau, N.; Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam; email: chau@cms.edu.vn

ISSN: 3048853

CODEN: JMMMD

DOI: 10.1016/j.jmmm.2006.01.094

Language of Original Document: English

Abbreviated Source Title: Journal of Magnetism and Magnetic Materials

Document Type: Article

Source: Scopus

Authors with affiliations:

1. Chau, N., Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam

2. Hanh, D.T., Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam
3. Tho, N.D., Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam
4. Luong, N.H., Center for Materials Science, University of Science, Vietnam National University, Hanoi, 334 Nguyen Trai Street, Hanoi, Viet Nam

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