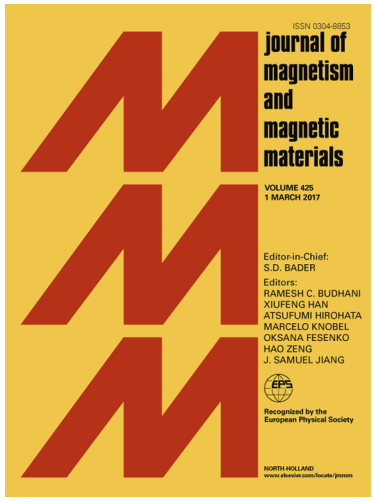

Research articles

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PII: S0304-8853(18)31775-X
DOI: https://doi.org/10.1016/j.jmmm.2018.08.038
Reference: MAGMA 64235

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 8 June 2018
Revised Date: 14 August 2018
Accepted Date: 16 August 2018

Please cite this article as: V. Solanki, Md. Motin Seikh, A.K. Kundu, Influence of Chromium in the Structural and Magnetic Properties of $LaCo_{0.5}Cr_{0.5}O_3$ Perovskite, *Journal of Magnetism and Magnetic Materials* (2018), doi: https://doi.org/10.1016/j.jmmm.2018.08.038

Influence of Chromium in the Structural and Magnetic Properties of $LaCo_{0.5}Cr_{0.5}O_3$ Perovskite

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ABSTRACT

Polycrystalline rare earth orthochromite $LaCo_{0.5}Cr_{0.5}O_3$ has been synthesized by soft chemical method with the rhombohedral (R-3c space group) structure and physical properties such as magnetism has been compared with the prototype perovskite $LaCo_{0.5}Fe_{0.5}O_3$ (orthorhombic: Pbnm). The magnetic transition is much lower (295 K) than the orthoferrite $LaCo_{0.5}Fe_{0.5}O_3$, although it is also a canted antiferromagnet at low temperature. However, this perovskite faintly resembles the behavior of the parent $LaCrO_3$ (orthorhombic: Pnma), which is reported to be weak ferromagnet at room temperature. The magnetic behavior of $LaCo_{0.5}Cr_{0.5}O_3$ perovskite could be explained by the superexchange mechanism gives rise to antiferromagnetic interactions between the metal cations: Co^{3+}-O-Cr^{3+}, Co^{3+}-O-Co^{3+} and Cr^{3+}-O-Cr^{3+}.

Keywords: Sol-gel synthesis; X-ray diffraction; Orthochromite; Antiferromagnetic

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