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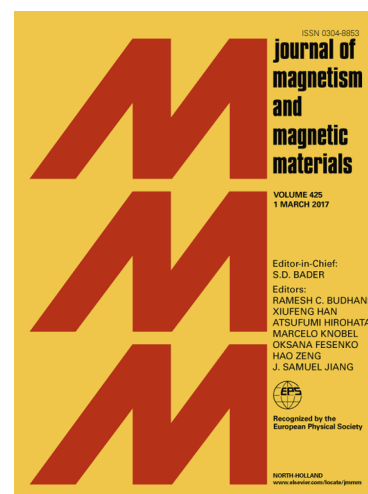
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Influence of Chromium in the Structural and Magnetic Properties of $\text{LaCo}_{0.5}\text{Cr}_{0.5}\text{O}_3$ Perovskite

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ABSTRACT

Polycrystalline rare earth orthochromite $\text{LaCo}_{0.5}\text{Cr}_{0.5}\text{O}_3$ 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 $\text{LaCo}_{0.5}\text{Fe}_{0.5}\text{O}_3$ (orthorhombic: Pbnm). The magnetic transition is much lower (295 K) than the orthoferrite $\text{LaCo}_{0.5}\text{Fe}_{0.5}\text{O}_3$, 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 $\text{LaCo}_{0.5}\text{Cr}_{0.5}\text{O}_3$ perovskite could be explained by the superexchange mechanism gives rise to antiferromagnetic interactions between the metal cations: $\text{Co}^{3+}\text{-O-Cr}^{3+}$, $\text{Co}^{3+}\text{-O-Co}^{3+}$ and $\text{Cr}^{3+}\text{-O-Cr}^{3+}$.

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

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