

INFLUENCE OF La^{3+} WITH Pr^{3+} TO STRUCTURE, MICROSTRUCTURE, AND MAGNETOTRANSPORT PROPERTIES IN BARIUM MANGANITE PEROVSKITE

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ABSTRACT

Polycrystalline perovskite manganite of $(\text{La},\text{Pr})_{0.67} \text{Ba}_{0.33} \text{MnO}_3$ bulk ceramic samples were synthesized by conventional solid-state route. The structure, microstructure, electrical and magnetic properties were studied. Substitution of La^{3+} with Pr^{3+} promote coarsening of microstructure formation and influencing the connectivity of grains which resulting an increase in resistance. This substitution promotes magnetic dilution and consequently leading to the suppression of magnetic behaviour. The metal-insulator transition temperature, T_P drops drastically from 264K (LBMO) to 127K (PBMO). PBMO displayed higher %MR in 10kG applied external magnetic field at room temperature which is -8.8% as compared to LBMO (-5.2%) because of magnetic dilution and reduced the magnetic saturation. Meanwhile, reduction in bond angle and bond length of $\text{Mn}^{3+}-\text{O}^{2-}-\text{Mn}^{4+}$ due to the distortion in MnO_6 might enhance DE and JT mechanism. In this work, the %MR at room temperature enhanced by replacing La^{3+} with Pr^{3+} but weaken the LFMR effect.

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