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MAGNETORESISTIVE AND MAGNETIC PROPERTIES OF $La_{0.67}A_{0.33}MnO_3$ (A= Ba, Ca, and Sr) PREPARED BY CO-PRECIPITATION METHOD

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ABSTRACT

We have prepared perovskite structured La0.67A0.33MnO3 manganite (A = Ba, Ca and Sr) using co-precipitation method. The samples were characterized using x-ray diffraction (XRD) and scanning electron microscope (SEM) to identify the structure and microstructure. The magnetic and magnetoresistance properties were measured by vibrations sample magnetometer (VSM) and four point probe methods. From the XRD spectrum, samples are in single phase pervoskite structure where LBMO and LCMO showed orthorhombic whereas LSMO has rhombohedral phase. LSMO has average grain size range of 0.5μm -2.5μm. However, for LBMO and LCMO, the grain boundaries are not well define and connected. The difference in the microstructure image might be due to the different activation energy and variance A-site cation that differs in grain growth. The Curie temperature of LBMO and LSMO are 343K and 371K, respectively. LCMO system gives the highest CMR value (-10.1% at 1 tesla) at room temperature. A significantly low field magnetoresistance effect (LFMR) which is -13.9% (at 0.1T, 90K) has been observed in LBMO and this LFMR effect is believed to be due to the disorder layers at the grain boundaries in the samples.

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