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STRUCTURAL AND ELECTRICAL PROPERTIES OF Pr1-xAExMnO3 (AE = Sr, Ba)

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ABSTRACT

Bulk samples of $Pr1_{-x}AE_xMnO_3$ (AE = Sr, Ba) were prepared through conventional solid state method. XRD analysis shows that Pr0.67Sr0.33MnO3 (PSMO) and $Pr0.67Ba_{0.33}MnO_3$ (PBMO) exhibited single phase orthorhombic structure with space group of Pnma and Imma, respectively. The lattice parameters (*a*,*b*,*c*), Mn-O-Mn bond angle and volume of the structure increased when smaller Sr atom was replaced with bigger Ba atom. SEM micrograph shows different grain size with 1.6μm for PBMO and 9.1μm for PSMO. The metal-insulator transition temperature, Tp was found different where PBMO show double Tp value (150K, 182K), where PSMO give single Tp value of 286K. The difference is believed to be due to the different phases of the surface and core of the grain. Typical polycrystalline type of MR behavior (intrinsic accompany with extrinsic MR effect) is observed. However, the intrinsic effect is more dominant in both cases. In this study, substitution of various atomic radius in Pr site greatly influences the structural and electrical properties in $Pr0.67(Ba, Sr)_{0.33}MnO_3$ system.

Keywords: metal-insulator transition temperature; manganese oxide
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