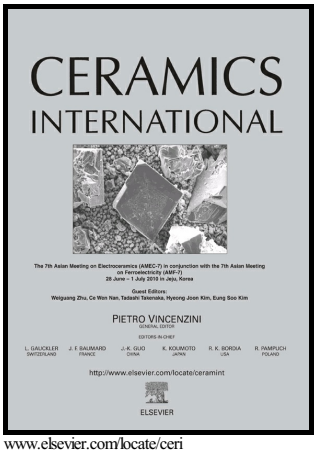

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Room Temperature Metal-Insulator Transition Observed in Pb Substituted Lanthanum Manganite

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Abstract

Structural, magnetic and transport property of Pb substituted$LaMnO_3$ ($La_{1-x}Pb_XMnO_3$; x = 0.1, 0.2, 0.3, 0.4, 0.5) prepared by solid state reaction route have been studied systematically.X-ray diffraction,SEM, VSM,magneto-transport measurements were carried out on prepared samples. All the samples below x = 0.4 composition were crystallized into single phase with R-3C space group of trigonal crystal class.The explored physical properties like magnetoresistance (MR), resistivity, metal–insulator transition temperature (T_P), magnetization (M_s)and Curie temp. (T_C) varies with Pb concentration.Higher T_P (298 K) and minimum resistivity was recorded for x= 0.3 sample whereas no distinct peak corresponding to metal-insulator transition was observed for $La_{0.5}Pb_{0.5}MnO_3$. Appreciable magnetoresistance (MR%) values were obtained for all the samples at 300K.X-ray photoelectron spectroscopy (XPS) confirms the +2 oxidation state of Pb inall substituted samples. Fine tuning of T_c could be