INFLUENCE OF Sm^{3+} SUBSTITUTION AT La-SITE ON RESISTIVITY AND MAGNETORESISTANCE OF $(La_{1-x}Sm_x)_{0.8}Ag_{0.2}MnO_3$

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This Final Year Project report entitled **"Influence of the substitution of magnetic ions for La-site in $(La_{1-x}Sm_x)_{0.8}Ag_{0.2}MnO_3$ on its magnetic and electrical properties"** submitted by Mohd Ikhwan Bin Adzam, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the faculty of Applied Sciences and was approved by

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ABSTRACT

INFLUENCE OF Sm^{3+} SUBSTITUTION AT La-SITE ON RESISTIVITY AND MAGNETORESISTANCE OF $(La_{1-x}Sm_x)_{0.8}Ag_{0.2}MnO_3$

The effect of Samarium, Sm^{3+} substitution at La-site in $(La_{1-x}Sm_x)_{0.8}Ag_{0.2}MnO_3$ (x=0.00, 0.05 and 0.10) system on structural and magneto-transport properties have been investigated. The samples were prepared using solid state reaction method. XRD data shows that the samples are single phase with orthorhombic distorted perovskites structure. Temperature dependence resistivity measurements showed double peaks T_{p1} and T_{p2} with metallic behavior below transition temperature and insulator behavior above transition temperature. With increasing Sm^{3+} concentration, the metal-insulator transition, T_{p1} and T_{p2} shifted to lower temperature and resistivity increase. This was probably due to the weakening of the double-exchange mechanism. However, under 0.7T of magnetic field, the resistivity of all samples decreased with T_{p1} shifted to higher temperature. However, T_{p2} does not changed with the increase in magnetic field. The decrease in resistivity for each sample is probably due to improved alignment of the electron pair involved in the strengthening the double-exchange mechanism and weakening the Jahn-Teller effect. The metallic region was fitted to the electron-magnon scattering model and insulator region was fitted to Mott-VRH model (Variable Range Hopping).

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