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Metal-

insulator transitions in hole- and electron-doped $\text{Sm}_{1-x}\text{A}_x\text{NiO}_3$ thin films

P.-H. XIANG, 1AIST 2JST,CREST, H. YAMADA, I.H. INOUE, A. SAWA, AIST, H. AKOH, 1AIST 2JST,CREST — We present a study of the transport properties of hole- and electron-doped $\text{Sm}_{1-x}\text{A}_x\text{NiO}_3$ ($\text{A} = \text{Ca}^{2+}, \text{Ce}^{4+}, 0 \leq x \leq 0.1$) thin films deposited on $\text{LaAlO}_3(001)$ substrates by pulsed-laser deposition method. The temperature-driven metal-insulator (MI) transition of the $\text{Sm}_{1-x}\text{A}_x\text{NiO}_3$ films is progressively suppressed by either hole or electron doping. The $\text{Sm}_{1-x}\text{A}_x\text{NiO}_3$ ($x = 0.1$) films show metallic conductivity over measured temperature range (5-350K). The effect of hole doping on the MI transition has been investigated in detail. The MI transition temperature (T_{MI}) can be tuned around room temperature by 3% Ca doping. In addition, we observe an anomaly in the resistivity below T_{MI} , which may correspond to the Néel temperature (T_N) for SmNiO_3 system [1]. Based on the results of the transport properties, a possible phase diagram for the hole-doped $\text{Sm}_{1-x}\text{A}_x\text{NiO}_3$ thin films has been deduced.

[1] J. Pérez-Cacho, J. Blasco, J. García, M. Castro and J Stankiewicz, J. Phys.: Condens. Matter. **11** (1999) 405.

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