Epitaxial Growth and Characterization of Sr-Doped Lanthanum Titanate Thin Films

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ABSTRACT

In this study, Sr-doped LaTiO3 (SrxLa1-xTiO3,SLTO, x ?T 0.6) thin films were grown on the Si(100) and LaTiO3(100) substrates by the off-axis rf magnetron co-sputtering system. In the experiments, we expect some La3+ ions were replaced by Sr2+ ions in the samples, and introduced the hole carriers. The in-situ grown specimens show electrical conduction, and the temperature dependence of resistivity and Hall coefficients were measured to study the transport properties. The temperature dependence of the resistance metallic and deviate from free electron gas model obviously. The transport behavior can be attributed to the electron-phonon interaction in the system. The Hall measurements show the films are p-type for x < 0.5 and switch to n-type at x > 0.5 . In addition, near the transition edge, the samples x = 0.57 and x = 0.60 change from p-type to n-type below the room temperature.

Keywords : SrxLa1-xTiO3 ; electron-phonon interaction ; transport ; Hall coefficient

Table of Contents

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