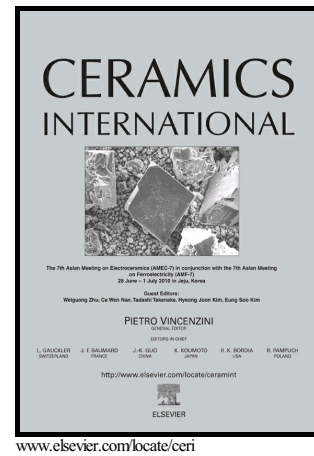


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Growth of highly *c*-axis oriented LaNiO₃ films with improved surface morphology on Si substrate using chemical solution deposition and rapid heat treatment process

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ABSTRACT

LNO (LaNiO₃) thin films were directly deposited onto Si substrates with a thin layer of amorphous natural oxide (SiO₂) using three different precursor solutions. Effects of the constitution of precursor solution and the annealing heating rate on the surface morphology and the orientation were investigated. The LNO film derived from the mixture of a methanol solvent and an acetylacetonate chelating agent had the flat surface with no cracks and pinholes. The heating rate of rapid annealing process had a critical effect on the oriented growth of the LNO film, and its *c*-axis orientation degree increased with the annealing heating rate. The LNO film with the heating rate of 40 °C/s exhibited the highest degree of *c*-axis orientation (99.57%) and the lowest resistivity ($9.35 \times 10^{-4} \Omega \cdot \text{cm}$). It would be a potential bottom electrode and/or seed layer to integrate perovskite-type films on it for functional devices.

Keywords: LaNiO₃; Orientation; CSD; Rapid thermal annealing; Mechanism

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