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Near Edge X-ray Absorption Fine Structure Spectroscopy for Pr_{0.65}Ca_{0.35}MnO₃ films

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The magnetic and electronic properties of the colossal magnetoresistance (CMR) compounds have traditionally been explained by the double exchange model¹ which considers the transfer of an electron (or hole) between neighboring Mn³⁺(d⁴) and Mn⁴⁺(d³) ions. The Pr_{0.65}Ca_{0.35}MnO₃ compound belongs to a family of perovskite-like manganites system which show the CMR properties. The Pr_{0.65}Ca_{0.35}MnO₃ system consist formally of Mn³⁺ and Mn⁴⁺ ions. The magnetic and transport properties of perovskite manganites system can be varied by the change of the Mn³⁺ / Mn⁴⁺ ratio.

The Pr_{0.65}Ca_{0.35}MnO₃ films have a different structure according to the substrate structure though the chemical compositions are same for all films. In addition, this different structure of films may be results in the change of the Mn³⁺ / Mn⁴⁺ ratio.

In this study, the poly-crystalline Pr_{0.65}Ca_{0.35}MnO₃ films were prepared by a laser ablation method on the various substrates, i.e., Polico, YSZ, Si/Ti, and LaAlO₃(100) single crystal. We examined the behavior of intermediate Pr_{0.65}Ca_{0.35}MnO₃ films according to various substrates by means of Pr M_{4,5}, Ca L_{2,3}, Mn L_{2,3}, and O K-edge X-ray absorption spectroscopy(XAS). These XAS spectra were obtained at the U7 undulated beam line of the Pohang Light Source.

[참고문헌]

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