**Electrical properties of LaVO₃ thin films**

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LaVO₃ thin films have been deposited on SrTiO₃ and LaAlO₃ substrate by pulsed laser deposition. The structure of LaVO₃ thin films were measured by high-resolution x-ray diffraction. It indicated the epitaxial growth with (002) diffraction patterns on LaVO₃ thin films and substrate. After the film growth, we measured electrical resistivity of LaVO₃ thin films using van der Pauw geometry in the temperature range of 77 ~ 300 K. The resistivity vs temperature curve exhibited insulating behavior on LaAlO₃ substrate. However, it exhibited metallic behavior on SrTiO₃ substrate. To understand this phenomenon, we have investigated electronic reconstruction at the interface of the films and substrate.

**Keywords:** Mott isulator, Thin film

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**The Electrical properties of LaTiO₃₋ₓ on LaAlO₃ substrate.**

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Recently, Mott insulator such as LaMnO₃, VO₂, etc. has been widely studied because of their unusual properties. Especially, metal-insulator transition of Mott insulator has great potential for novel electric device like non volatile memory device. Metal –insulator transition of LaTiO₃₋ₓ single crystal is widely investigated by many researchers. On the other hand, reports on metal-insulator transition of LaTiO₃₋ₓ thin film are much less than single crystal bulk LaTiO₃₋ₓ because stabilizing Ti ³⁺ state is difficult. Ohtomo et al. reported that LaTiO₃₋ₓ thin films grown on SrTiO₃ substrate have mixed Ti valence and exhibit metallic behavior because of electronic reconstruction. In this study, we successfully fabricated insulating state LaTiO₃₋ₓ thin films on the LaAlO₃ substrate. To prevent charge reconstruction and oxygen vacancy at the interface, LaAlO₃ substrate is used. Structures of LaTiO₃₋ₓ thin films are studied by x-ray diffraction. Pseudo-cubic LaTiO₃₋ₓ thin films were epitaxially grown on LaAlO₃ substrate at ambient oxygen pressures below 10⁻⁶ Torr. The transport property of LaTiO₃₋ₓ thin film was measured using the van der Pauw geometry in the temperature range 77 K<T<300 K. The resistivity versus temperature curves exhibit insulator behavior below 10⁻⁵ Torr of oxygen ambient pressure. With increasing oxygen content (δ), LaTiO₃₋ₓ thin film changes from insulator to metal with hole concentration of 2δ. When δ more increases, LaTiO₃₋ₓ changes to a band insulator.

**Keywords:** thin film, mott insulator, Mftransition