CQ01

Growth of $YTiO_3$ Thin Films on Various Substrates

C. U, Jung[1]* and Seung Chul Chae[2]

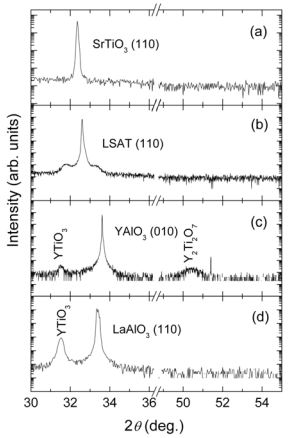
[1]Dept. of Physics, Hankuk University of Foreign Studies, San 89, Wangsan-ri, Mohyeon-myun, Yongin, Gyounggi-Do 449-791, Korea

[2]ReCOE & FPRD, School of Physics and Astronomy, Seoul National University, Seoul 151-747

*Corresponding author: C. U. Jung, e-mail: cu-jung@hufs.ac.kr

Many physical properties are closely coupled in strongly correlated oxide with perovskite structure. Coupling between magnetism and transport properties in metallic oxide showed a colossal magnetoresistance. Coupling between magnetism and dielectric properties in certain magnetic insulating perovskites showed interesting properties such as multiferrocity. One challenge in the research of multiferrocity is the scarcity of such materials in nature. Most insulators are paraelectric (PE) and antiferromagnetic. Thus we turn our attention to other magnetic insulator. In this work, we report on the growth of $YTiO_3$ thin films on various substrates with different lattice mismatch by using the pulsed laser deposition [1]. To apply the anisotropic in-plane stress, the STO, LSAT, LAO (110) and orthorhombic YAO (010) substrate were used.

Figure 1 shows the x-ray diffraction patterns of $YTiO_3$ thin films grown on $SrTiO_3$ (110), LSAT (110), $YAlO_3$ (010), and $LaAlO_3$ (110) single crystals. STO (110), LSAT (110), YAO(010) substrates could not stabilize $YTiO_3$ epitaxial phase and YAO(010) substrate also resulted in other impurity phases. Only $LaAlO_3$ (110) substrate with smallest lattice mismatches could give us pure YTO phase



REFERENCES

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CQ02

Cobalt Effects on the Structure, Electrical and Magnetic Properties of $La_{0.7}Ca_{0.3}Mn_{1-x}CoxO_3$(x=0~0.07) Mangannite Oxide

Young Joo Kim, Shalendra Kumar, Chan Gyu Lee, and Bon Heun Koo*

School of Nano & Advanced Materials Engineering, Changwon National University, Changwon, Korea

*Corresponding author: e-mail: bhkoo@changwon.ac.kr

The colossal magneto resistance (CMR) materials can be used in magnetic reading heads, field sensors and memories. We have investigated the structure, the magnetic and the electrical properties of Co-doped $La_{0.7}Ca_{0.3}MnO_3$ CMR system. . The physical properties of the substituted manganites depend on their structure, composition and oxidation states of Mn ions. Doping of the divalent metal ions in $LaMnO_3$ induces ferromagnetism due to the change in the oxidation state of Mn ions. This indicates that the valence state of Mn ions play a key in the tuning the physical properties of manganites. The field cooled magnetization measured as a function of temperature indicates that all Co composition exhibits ferromagnetic (FM) to paramagnetic (PM) transition with increase in the temperature. Moreover, the doping of Co affects the colossal magnetoresistance (CMR) effect in the present materials. Details of the temperature dependence of ρ and its magnetic field dependence (MR%) are discussed.