Co 산화물 박막의 구조 및 전자기적 성질

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Electric and magnetic properties of perovskite oxides containing multivalent ion change a lot with the oxygen content. SrTiO3 is good insulator for stoichiometric compound while it becomes quite leaky with small amount of oxygen deficiency. Another good example is SrRuO3. The oxygen nonstiochiometry in this compound generated either by growth condition control or post hydrogen plasma treatment drives metal-insulator transition. These two compounds does not changes its crystal structure drastically with oxygen content. SrCoOx ($2.5 \leq x \leq 3.0$) is very rare example where crystal structure in addition to other physical properties changes significantly with oxygen content. SrCoO2.5 has brownmillerite structure with interesting ordering of oxygen vacancy while SrCoO3 is metallic perovskite. We successfully grew epitaxial thin film of both compounds. We will discuss its meta-stable physical properties and also the possibililty as a new device.