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Structural, Magnetic and Transport Study on $\text{SrSn}_{1-x}\text{Ru}_x\text{O}_3$ system HYUKWOO KWON, JUYEON SHIN, KOOKRIN CHAR, Seoul Natl Univ — SrSnO_3 is a diamagnetic material with a wide band gap. A theoretical calculation predicts that small Ru doped SrSnO_3 can be a dilute magnetic semiconductor (DMS) material. We have epitaxially grown the $\text{SrSn}_{1-x}\text{Ru}_x\text{O}_3$ ($0 \leq x \leq 0.3$) system by the pulsed laser deposition X-ray diffraction measurements show that films maintain a single phase over the doping range and lattice constants of the system decrease monotonously as the doping increases Transport measurements show that the films are semiconducting and their resistivities dramatically decrease as the Ru doping increases. On the other hand, Hall measurement data shows that the conduction of this system is mediated by hole carriers, which is closely related to the p-type conduction in SrRuO_3 , and its corresponding mobility values vary from $0.1 \sim 30 \text{ cm}^2/\text{V}\cdot\text{s}$, depending on the doping rate. Magnetic measurement data will be presented to investigate its ferromagnetism due to the doped Ru 4d character. In light of the electrical and magnetic property of this system, $\text{SrSn}_{1-x}\text{Ru}_x\text{O}_3$ system can be a promising material system for the field of spintronics and optoelectronics.

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