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Synthesis and anisotropic magnetic and transport properties of cubic SrCoO₃ single crystal YOUWEN LONG, YOSHIO KANEKO, ERATO-MF, JST, Wako 351-0198, Japan, SHINTARO ISHIWATA, Dep. Appl. Phys., Univ. Tokyo, Tokyo 113-8656, Japan, YASUJIRO TAGUCHI, CMRG and CERG, RIKEN-ASI, Wako 351-0198, Japan, YOSHINORI TOKURA, ERATO-MF, JST, CMRG and CERG, RIKEN-ASI, Wako 351-0198, Japan; Dep. Appl. Phys., Univ. Tokyo, Tokyo 113-8656, Japan — Solid state oxides containing transition metals with unusually high valence states exhibit interesting physical properties. However, due to the unstableness of these high valence states, high pressure is often needed to stabilize such high valence states. We were successful in growing a large-size SrCoO₃ single crystal by using high-pressure technique. This material shows good metallic behavior with high ferromagnetic Curie temperature about 305 K, and the easy magnetization axis is $\langle 111 \rangle$ direction. The spin moment of Co⁴⁺ ion measured at 2 K and 7 T is about $2.50 \mu_B$, suggesting an intermediate spin configuration as predicted by theoretical calculations. Although SrCoO₃ has a highly symmetric cubic crystal structure (Pm-3m), it exhibits significant anisotropic magnetoresistance at low temperatures.

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