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Fabrication of Phase-Pure Sr2CrOsO6 Epitaxial Films[1] J.M. LUCY, A.J. HAUSER, Department of Physics, The Ohio State University, H.A. SEIBEL, P.M. WOODWARD, Department of Chemistry, The Ohio State University, F.Y. YANG, Department of Physics, The Ohio State University — The newly discovered magnetic double perovskite Sr2CrOsO6 exhibits a combination of unique properties, including high Tc of 725 K, semiconducting band structure and nearly 100% spin-polarized valence and conduction bands indicated by a number of theoretical calculations. We have grown epitaxial Sr2CrOsO6 thin films by off-axis ultrahigh vacuum sputtering using a stoichiometric Sr2CrOsO6 target made by multistep solid state synthesis. Rietveld refinements of the x-ray diffraction (XRD) scans of the Sr2CrOsO6 target show mostly double perovskite Sr2CrOsO6 phase (a = 3.904 Å) with less than 1% secondary phases. Due to the perfect lattice match between Sr2CrOsO6 and SrTiO3, we chose LSAT substrates (a = 3.868 Å) to grow Sr2CrOsO6 films. XRD results demonstrated phase-pure, fully epitaxial Sr2CrOsO6 (100) films on LSAT with a rocking curve FWHM of 0.32 $^\circ$. Magnetic measurements for bulk Sr2CrOsO6 show an extremely large magnetic anisotropy with a coercivity of 2T at 385 K.

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