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Growth and characterization of epitaxial SmB6 thin films[1] SEUNGHUN LEE, XIAOHANG ZHANG, CNAM, Dept. Phys. and MSE, University of Maryland, DREW STASAK, Dept. MSE, University of Maryland, IFTEKHAR H. M. JAIM, CNAM, Dept. Phys. and MSE, University of Maryland, SHENG DAI, Dept. Chem. Eng. and Mater. Sci., University of California-Irvine, XIAOQING PAN, Detp. Chem. Eng. and Mater. Sci., and Dept. Phys. and Astro., University of California-Irvine, JAMES WILLIAMS, RICHARD L. GREENE, CNAM, Dept. Phys., University of Maryland, ICHIRO TAKEUCHI, CNAM, Dept. Phys. and MSE, University of Maryland — Samarium hexaboride (SmB_6) is a topological Kondo insulator, and it is one of the most promising candidates for exploring exotic quantum states based on the topological surface state. We have previously observed the superconducting proximity effect in the surface state of SmB_6 at in-situ formed superconductor/SmB_6 thin film bilayer interfaces [Phys. Rev. X. 6, 031031 (2016)]. Here we present structural and electrical characteristics of epitaxial SmB_6 thin films prepared by co-sputtering of SmB_6 and B targets. The stoichiometry in SmB_6 thin film is carefully examined by WDS measurements. XRD phi-scan measurement reveals the epitaxial relation of SmB_6 thin film and substrate. Epitaxial SmB_6 thin films shows low-temperature resistance plateau attributed to the emergence of the surface state, consistent with many previous reports. We also discuss current research efforts with epitaxial SmB_6 thin films to realize topological superconductivity.

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