

Abstract Submitted  
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**Low carrier concentration crystals of the topological insulator  $\text{Bi}_2\text{Te}_2\text{Se}$**  SHUANG JIA, HUIWEN JI, E. CLIMENT-PASCUAL, M.K. FUCCILLO, M.E. CHARLES, Department of Chemistry, Princeton University, JUN XIONG, N.P. ONG, Department of Physics, Princeton University, R.J. CAVA, Department of Chemistry, Princeton University — We report the characterization of  $\text{Bi}_2\text{Te}_2\text{Se}$  crystals obtained by the modified Bridgeman and Bridgeman-Stockbarger crystal growth techniques. X-ray diffraction study confirms an ordered Se-Te distribution in the inner and outer chalcogen layers, respectively, with a small amount of mixing. The crystals displaying high resistivity ( $> 1 \Omega\text{cm}$ ) and low carrier concentration ( $\sim 5 \times 10^{16}/\text{cm}^3$ ) at 4 K were found in the central region of the long Bridgeman-Stockbarger crystal, which we attribute to very small differences in defect density along the length of the crystal rod. Analysis of the temperature dependent resistivities and Hall coefficients reveals the possible underlying origins of the donors and acceptors in this phase.

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