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Thermoelectric Properties of Porous Bi_{0.5}Sb_{1.5}Te_{3.0}

By Waqar Hasan, Syed

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Fabricated by Using Metal Coated Powders | This research presents a novel technique to enhance thermoelectric properties of p-type Bi_{0.5}Sb_{1.5}Te_{3.0} (BST) polycrystalline materials by producing nano-to-micro sized porous structures in bulk samples. We initially coated BST powder with Tellurium nanowires. Thus, we designed a fast and inexpensive technique to synthesize Tellurium Nanowires with diameters ranging from 10 150 nm. There is a huge possibility to generalize this technique for chalcogenide nanowires growth. Porosity was dispersed in the SPS-ed pellets by vacuum evaporation of the coated Tellurium. The prevailing challenge in Pore generation is to control pore dimensions. In this research micro-to-nano sized pores are reported. Thermoelectric properties were significantly enhanced by porosity. Pore-BST interfaces, proved to be efficient phonon scattering centers, reduce lattice thermal conductivity down to 0.1 0.2 W/m.K. The overall ZT was 18% higher than the reference samples. X-Ray Diffraction, Field Emission Scanning Electron Microscopy (FE-SEM) and Energy Dispersive X-Ray Spectroscopy were used to study the structural and morphological features of our samples. | Format: Paperback | Language/Sprache: english | 88 pp.

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