

Journal of Materials Research, 26(15): 1755-1761

Enhanced Thermoelectric Performance of Compacted Bi_{0.5}Sb_{1.5}Te₃
Nanoplatelets with Low Thermal Conductivity

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Abstract

We report fabrication of compacted Bi_{0.5}Sb_{1.5}Te₃ nanoplatelets using hydrothermal methods followed by cold pressing and sintering in an evacuated ampoule at various temperature of 300–380 °C. The compacted Bi_{0.5}Sb_{1.5}Te₃ sintered at 340 °C has the highest power factor of 11.6 $\mu\text{W}/\text{cm}\cdot\text{K}^2$ and its thermal conductivity is 0.37 W/m·K at 295 K, which is very low as compared to the typical value of 1 W/m·K. The resulting dimensionless figure of merit ZT is 0.93 at 295 K.

Key words : Hydrothermal; Thermal conductivity; Thermoelectric