Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Understanding the Superior Thermoelectric Performance of Sb Precipitated $Ge_{17}Sb_2Te_{20}$

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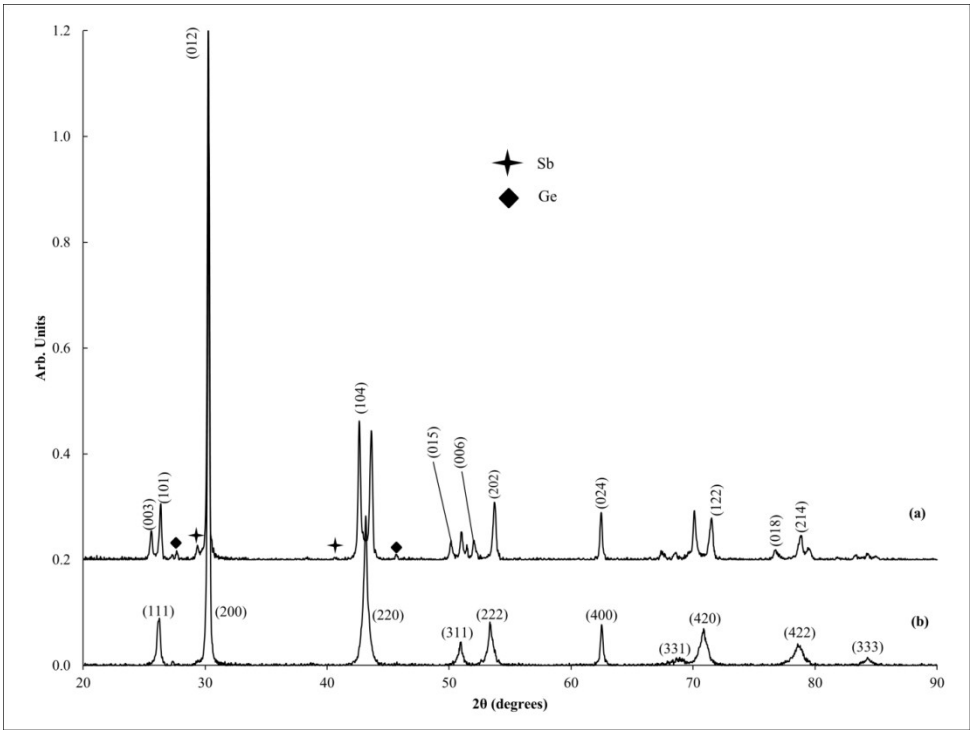

Figure S1 X-ray diffraction pattern of (a), rhombohedral (*R*-3*m*) $Ge_{17}Sb_2Te_{20}$ quenched from the melt at 900°C, and (b), rocksalt (*Fm-3m*) $Ge_{17}Sb_2Te_{20}$ quenched and subsequently annealed at 590°C for 24 hours. Secondary phases of elemental Sb and Ge were identified in the pattern of quenched $Ge_{17}Sb_2Te_{20}$.

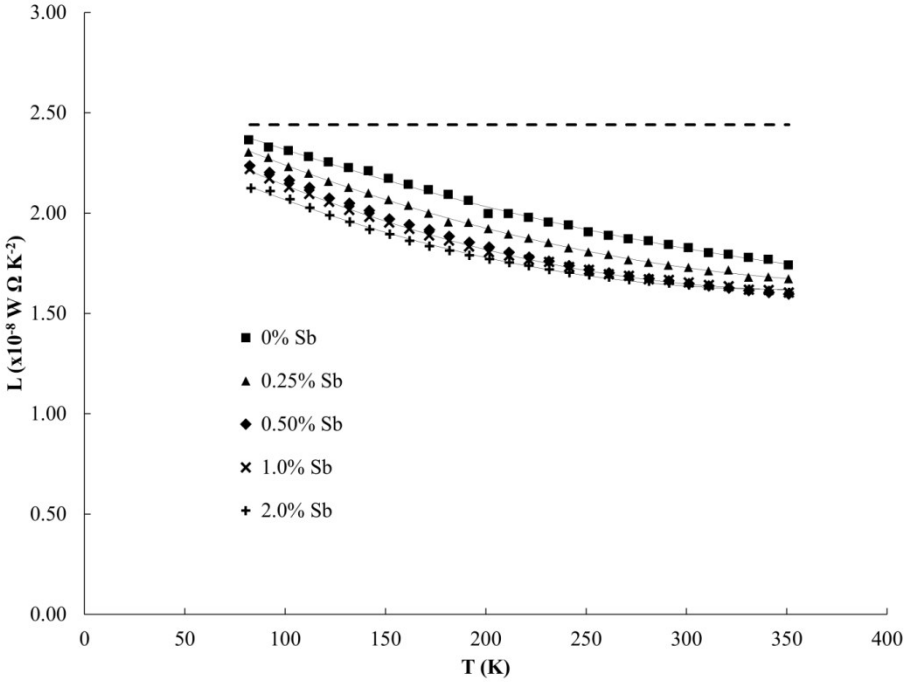

Figure S2 Calculated Lorenz number versus temperature for $Ge_{17}Sb_2Te_{20}$ and for 0.25%, 0.50%, 1.0%, and 2.0% Sb added to $Ge_{17}Sb_2Te_{20}$. This calculation, based on the single parabolic band model, shows a large deviation from the free electron value of 2.44×10^{-8} $W\Omega K^{-2}$.

Table SI
Electrical resistivity, Seebeck coefficient, carrier concentration, and hole mobility at room temperature

$Ge_{17}Sb_2Te_{20}+Sb_x$	ρ (mΩ-cm)	S (μVK^{-1})	p ($x10^{20}$ cm^{-3})	μ_h ($cm^2V^{-1}s^{-1}$)
x=0	1.68	120	0.575	87.8
x=0.0975	1.57	152	1.20	25.4
x=0.195	1.60	160	0.733	20.0
x=0.39	2.19	159	1.24	23.1
x=0.78	2.75	175	1.27	15.1