Supporting Information

Tailoring the thermoelectric performance of the layered topological insulator $SnSb_2Te_4$ through Bi positional doping at the Sn and Sb cation sites

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Supporting figures

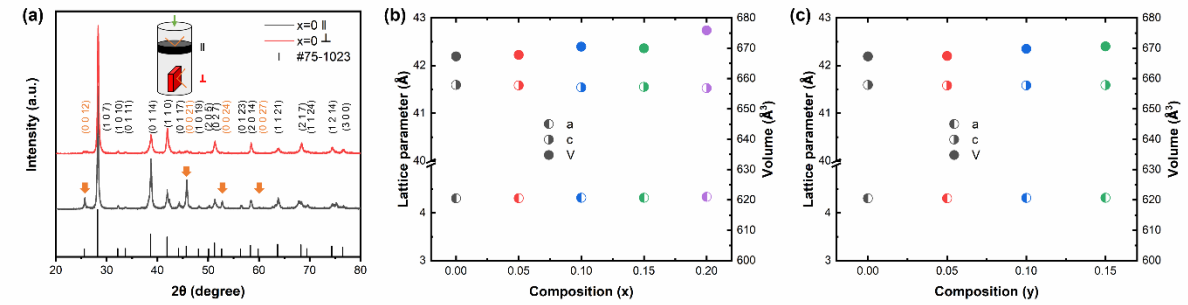


Figure S1. (a) Bulk sample XRD patterns of $SnSb_2Te_4$ in the parallel and perpendicular pressing direction, lattice parameters and volume of the (b) $Sn_{1-x}Bi_xSb_2Te_4$ and (c) $SnSb_{2-y}Bi_yTe_4$ samples.

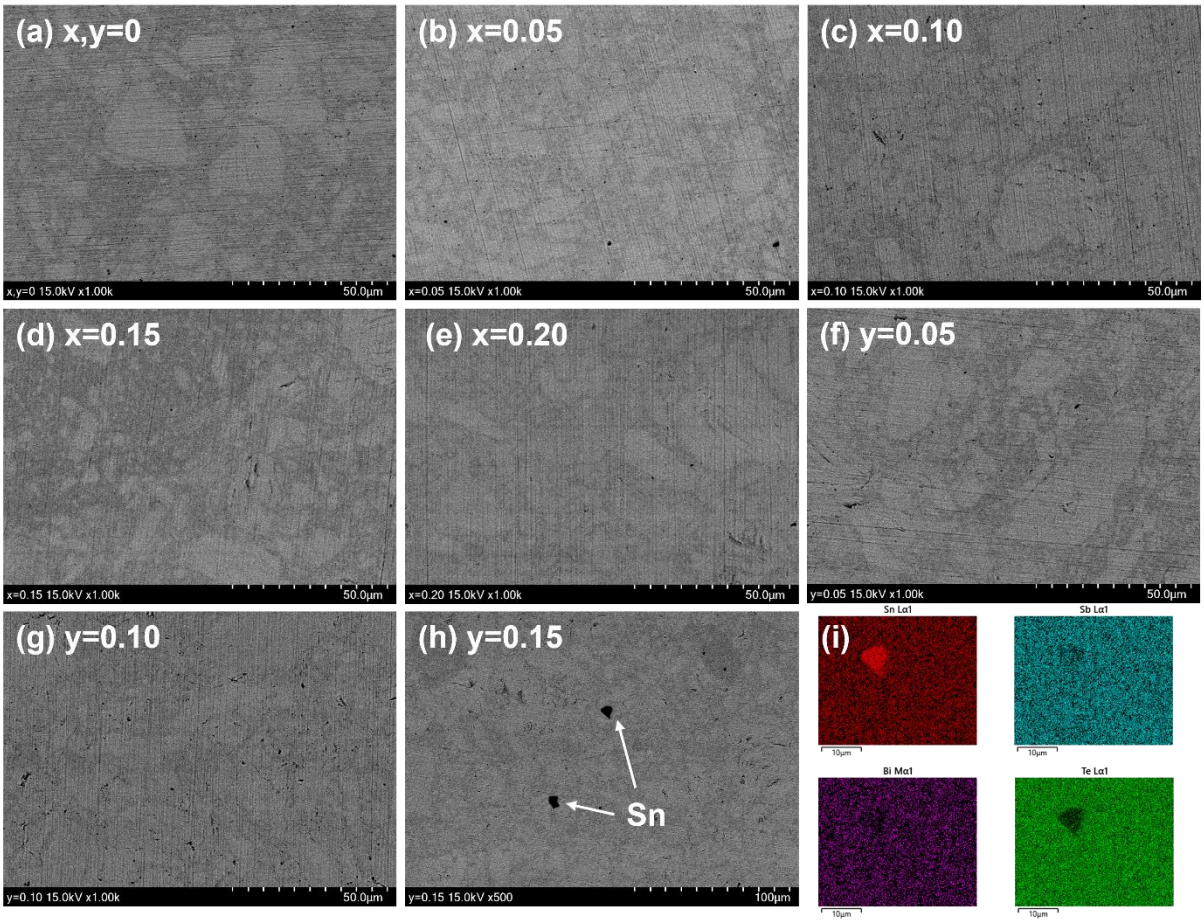
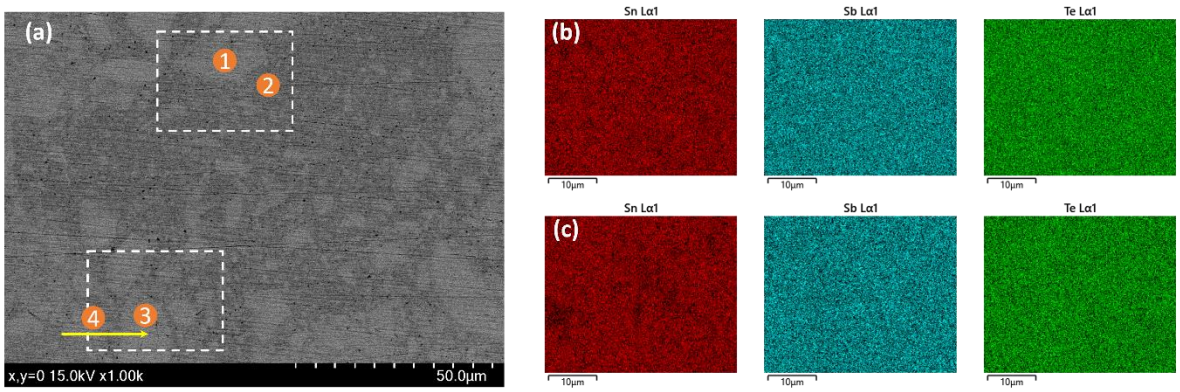
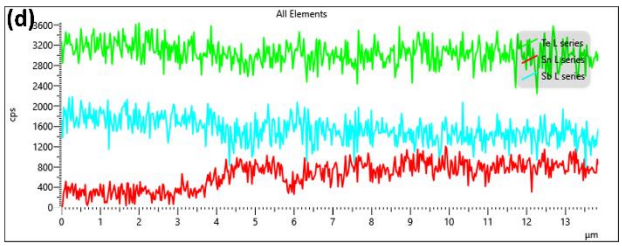


Figure S2. Back scattered SEM (BSE) images of the (a-e) $Sn_{1-x}Bi_xSb_2Te_4$ samples, (f-h) BSE images of the $SnSb_{2-y}Bi_yTe_4$ samples, and (i) EDS mapping of the mapping in (h).

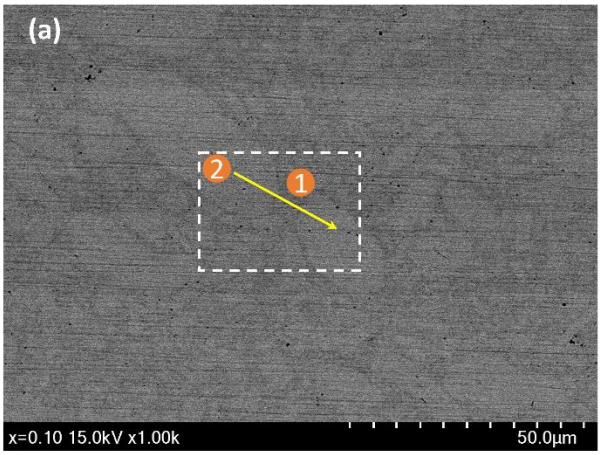


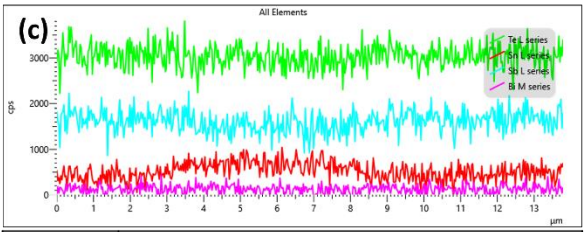


(e)

Atomic %			
Spot	Sn	Sb	Te
1	15.54	28.23	56.23
2	14.79	30.80	54.40
3	15.96	27.36	56.68
4	6.09	34.44	59.46

Figure S3. (a) BSE image, (b,c) EDS mapping, (d) line scan data along the yellow arrow and (e) point mapping data for the numbered spots for the x, y = 0 composition.





(d)

Atomic %				
Spot	Sn	Bi	Sb	Te
1	14.15	1.98	28.97	54.90
2	8.69	1.85	33.93	55.52

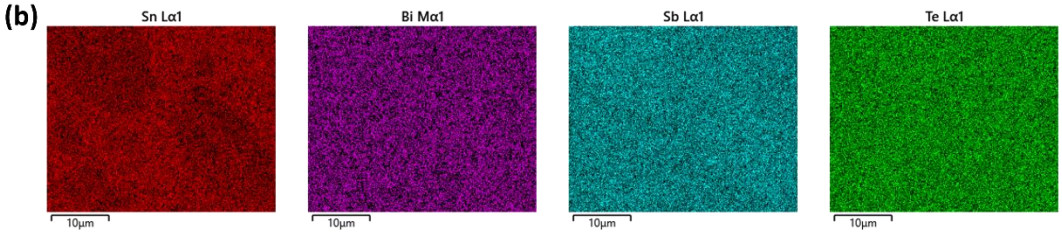
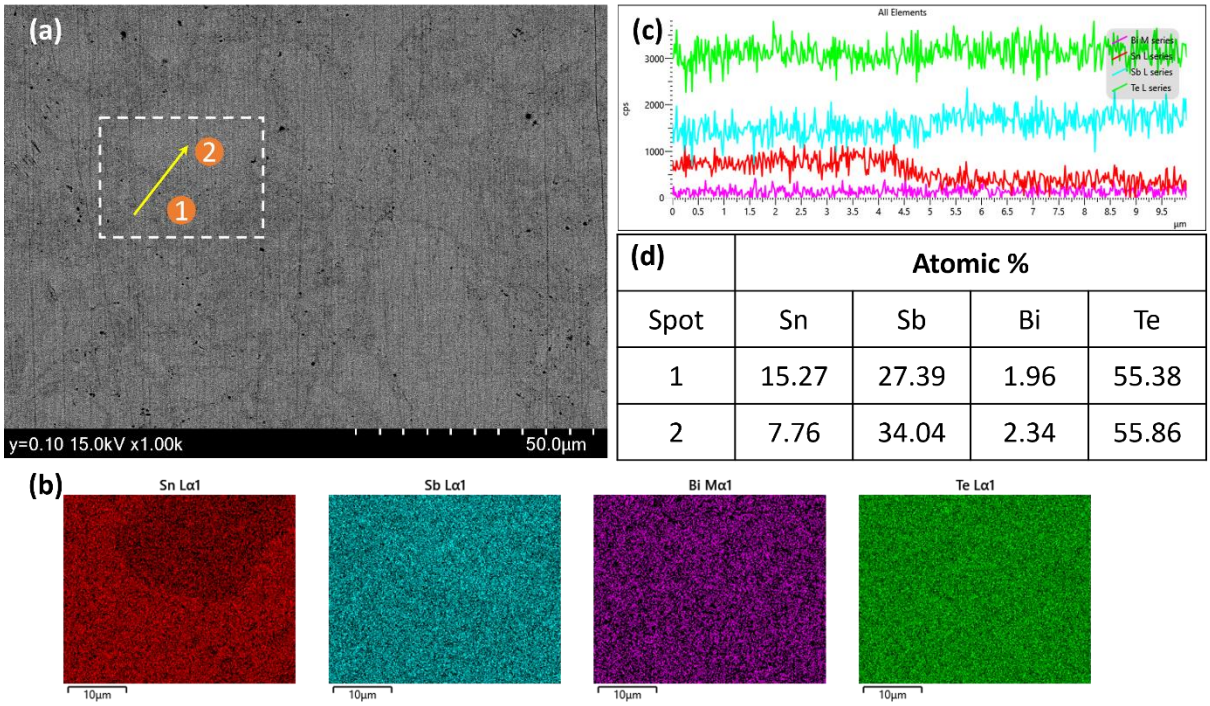


Figure S4. (a) BSE image, (b) EDS mapping, (c) line scan data along the yellow arrow and (d) point mapping data for the numbered spots for the x = 0.10 composition.



(d)

	Atomic %			
Spot	Sn	Sb	Bi	Te
1	15.27	27.39	1.96	55.38
2	7.76	34.04	2.34	55.86

Figure S5. (a) BSE image, (b) EDS mapping, (c) line scan data along the yellow arrow and (d) point mapping data for the numbered spots for the y = 0.10 composition.

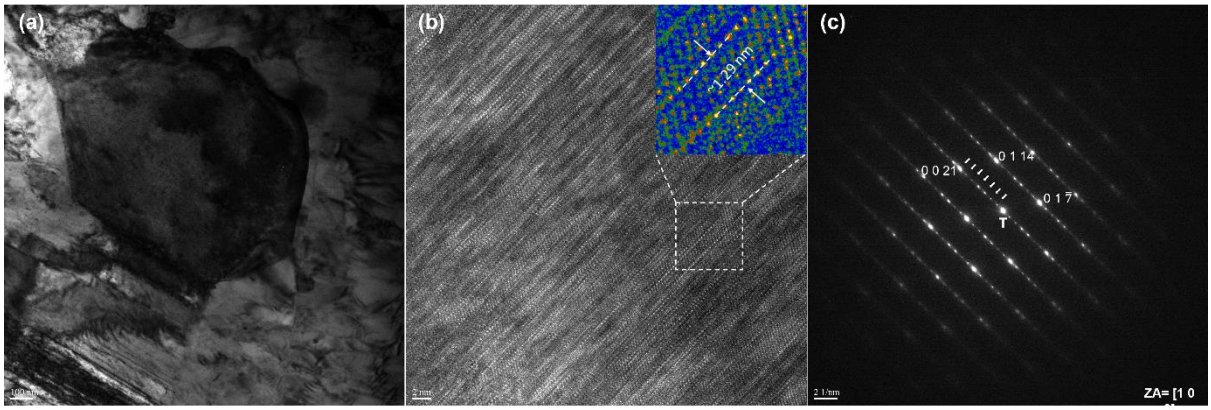


Figure S6. (a) Bright field (BF) image, (b) high resolution (HRTEM) image (INSET: colour modified region showing a stack of size ~1.29nm) and (c) selected area diffraction (SAED) pattern of the $SnSb_2Te_4$ sample.

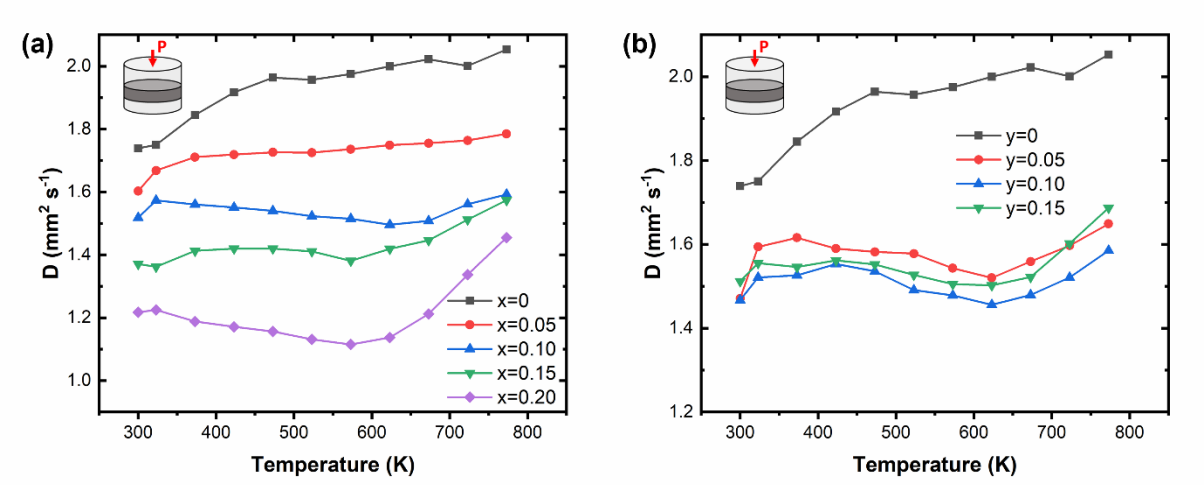


Figure S7. Temperature-dependent thermal diffusivity of the (a) $Sn_{1-x}Bi_xSb_2Te_4$ and (b) $SnSb_{2-y}Bi_yTe_4$ samples. INSET: LFA sample with measurement obtained along the parallel pressing direction.

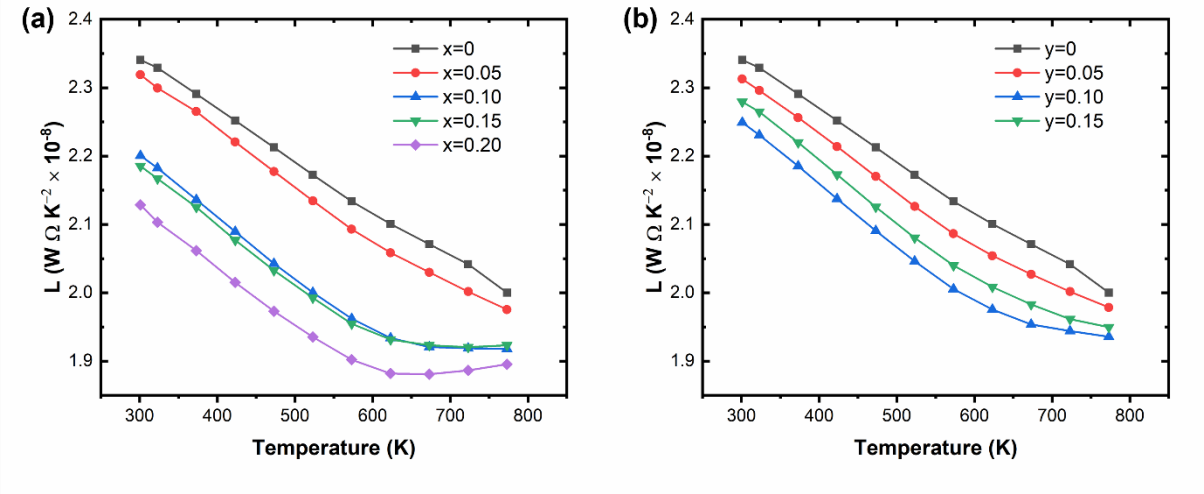


Figure S8. Temperature-dependent Lorenz number of the (a) $Sn_{1-x}Bi_xSb_2Te_4$ and (b) $SnSb_{2-y}Bi_yTe_4$ samples.