Supporting Information

Optimized orientation and enhanced thermoelectric performance in $Sn_{0.97}Na_{0.03}Se$ with Te addition

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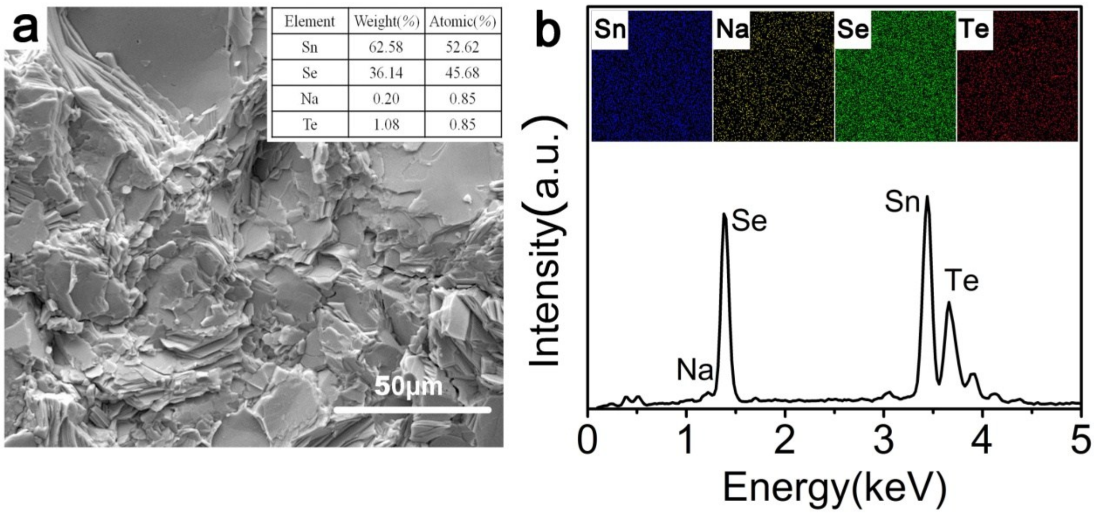

Element	Weight(%)	Atomic(%)
Sn	62.58	52.62
Se	36.14	45.68
Na	0.20	0.85
Te	1.08	0.85

Fig.S1 **The EDS measure of sintered bulk.** (a) Backscattered SEM image of $Sn_{0.97}Na_{0.03}Se$ + 15 *wt%* Te perpendicular to the pressing direction. (b) EDS profile taken from the entire area on the left with inset showing the elemental mapping of Sn, Na, Se, and Te.

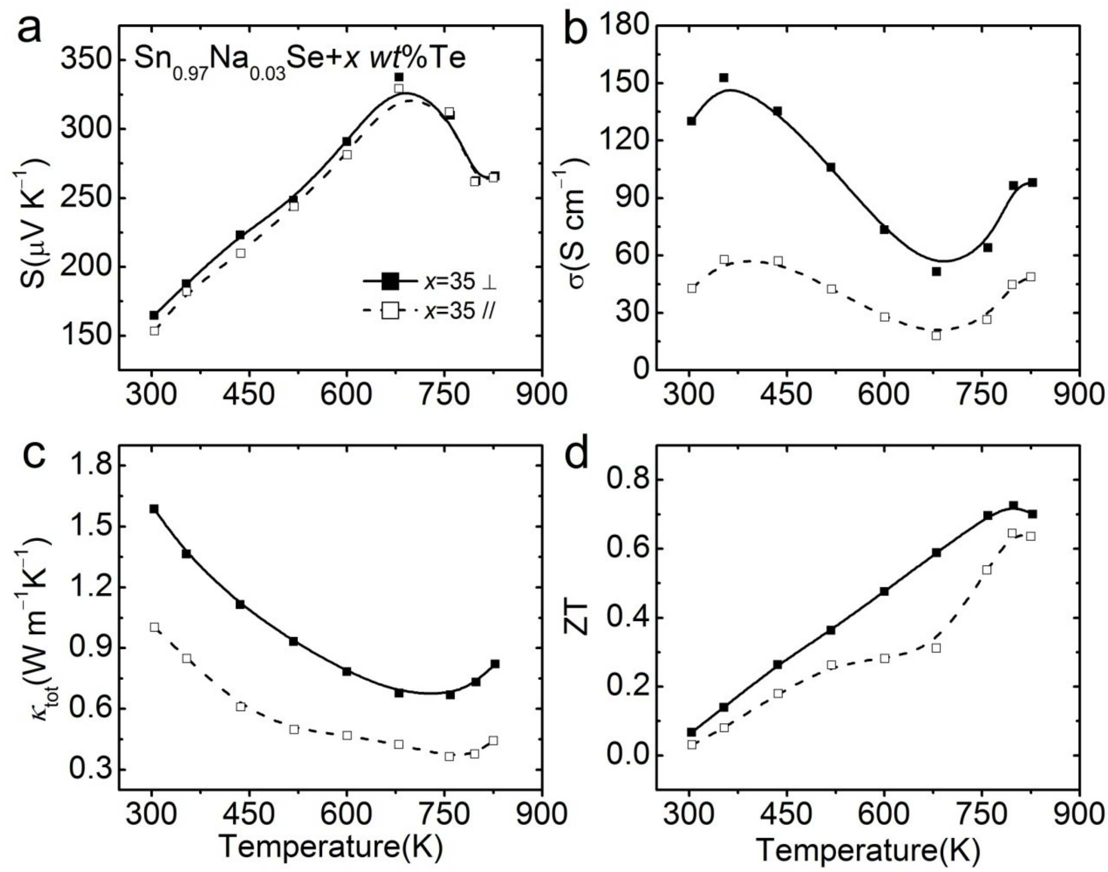

Fig.S2 The thermoelectric properties as a function of temperature along perpendicular (⊥) and parallel (//) to hot pressing direction. (a) the seebeck coefficient ; (b) the electrical conductivity; (c) the total thermal conductivity and (d) *ZT* for $Sn_{0.97}Na_{0.03}Se$ + 35 *wt%* Te bulks

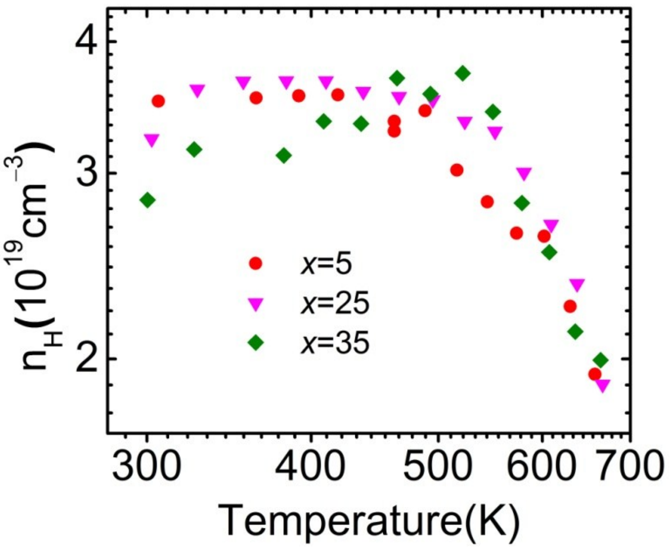

Fig. S3 Hall carrier concentration for $Sn_{0.97}Na_{0.03}Se$ + *x wt%* Te (*x* = 5, 25 and 35) samples

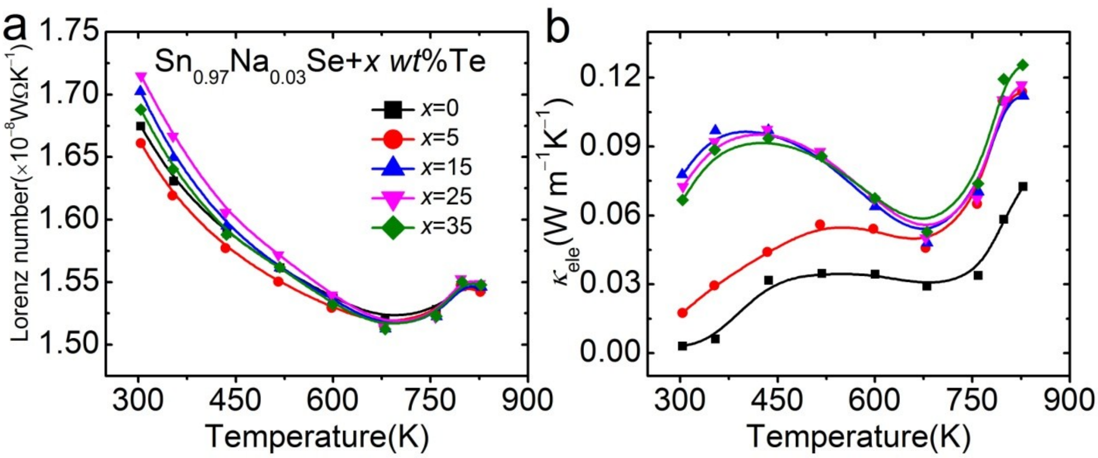

Fig.S4 Lorenz numbers and electronic thermal conduction as a function of temperature

Table S1. This work and previously reported *PF* ($\mu W\ cm^{-1}\ K^{-2}$) values at 300 K, 400 K, 500 K.

Samples	**300 K**	**400 K**	**500 K**
$Sn_{0.97}Na_{0.03}Se$ single crystal [1]	28.20	22.38	18.60
Hole doped SnSe single crystal [2]	40.02	35.55	29.31
This study	3.88	6.20	6.6
SnSe [3]	0.38	0.51	0.34
SnSe [4]	0.39	0.44	0.40
SnSe [5]	0.43	0.56	0.50
SnSe [6]	0.63	2.88	4.54
$Sn_{0.99}Na_{0.01}Se_{0.84}Te_{0.16}$ [7]	1.70	2.92	4.09
$Sn_{0.985}Na_{0.015}Se$ [8]	1.27	2.49	2.61
$Sn_{0.99}Na_{0.01}Se$ [9]	0.25	0.29	0.29
SnSe+0.5%(Na,K) [10]	1.27	2.18	4.18
$Sn_{0.97}Na_{0.03}Se$ HD [11]	0.71	3.57	6.39
$Sn_{0.97}Na_{0.03}Se_{0.8}S_{0.2}$ [12]	0.20	0.51	1.69
SnSe+3%PbSe [13]	2.08	3.95	4.44
$Sn_{0.882}Cu_{0.118}Se$ [14]	2.47	2.34	0.61
$Sn_{0.99}Cu_{0.01}Se$ [15]	0.33	1.57	3.07
$Sn_{0.98}Zn_{0.01}Pb_{0.01}Se$ [16]	0.70	1.89	3.21

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