

## Supporting Information:

### The Importance of the Mg-Mg interaction in $Mg_3Sb_2$ - $Mg_3Bi_2$ Shown Through Cation Site Alloying

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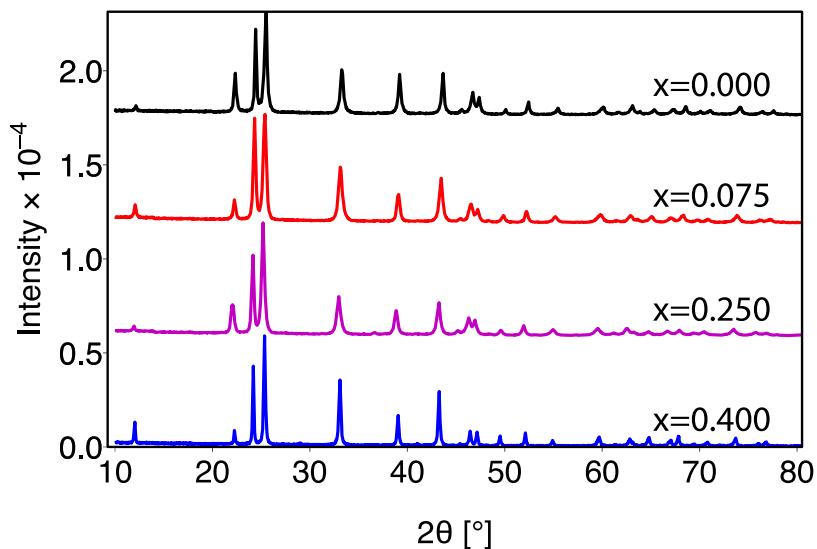


Figure S1: X-Ray diffraction for  $Mg_{3.125-x}Yb_xSb_{1.5}Bi_5Te_{0.01}$  samples

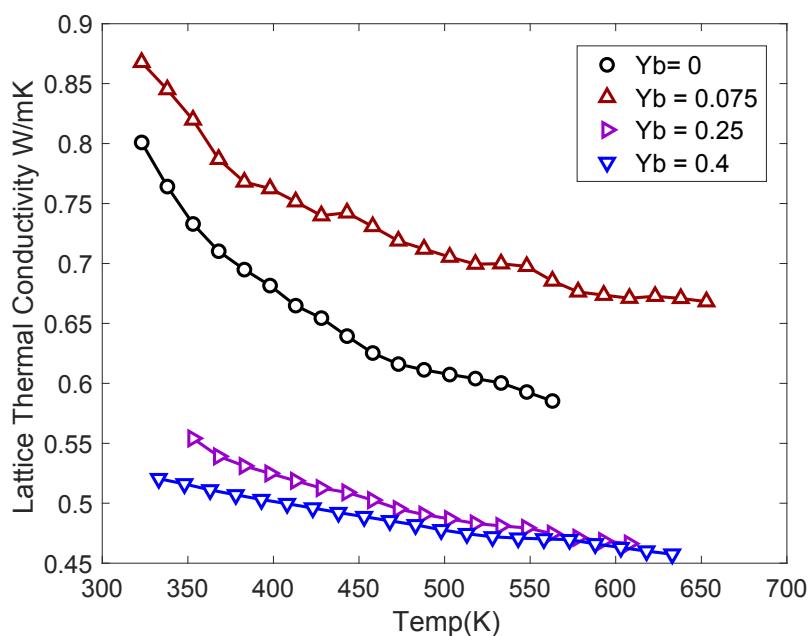
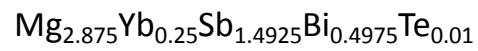
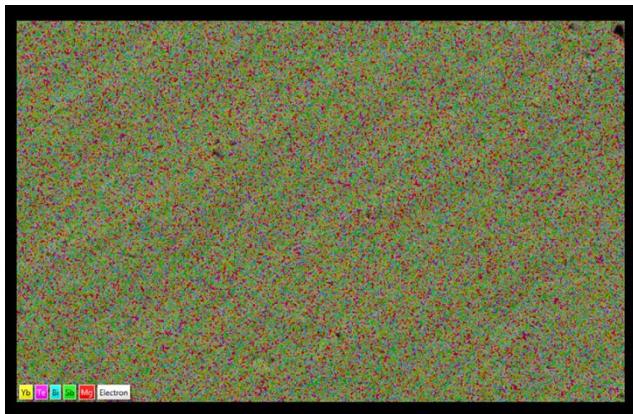


Figure S2: Lattice Thermal Conductivity for  $Mg_{3.125-x}Yb_xSb_{1.5}Bi_5Te_{0.01}$  samples



	Nominal Atomic %	EDS Map Atomic %	Uncertainty
Mg	55.0	53.7	1.4
Sb	29.9	30.3	1.2
Te	0.2	1	1.0
Yb	5.0	5.4	0.4
Bi	10.0	9.7	0.3

\* Uncertainty based on Standard deviation of composition between different point scans

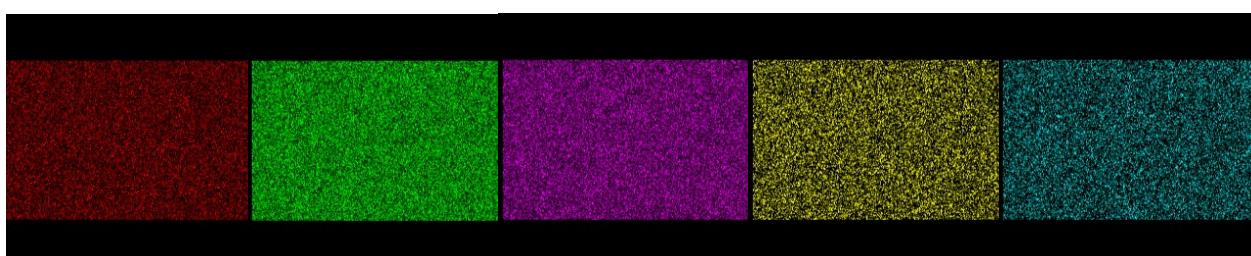
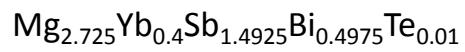
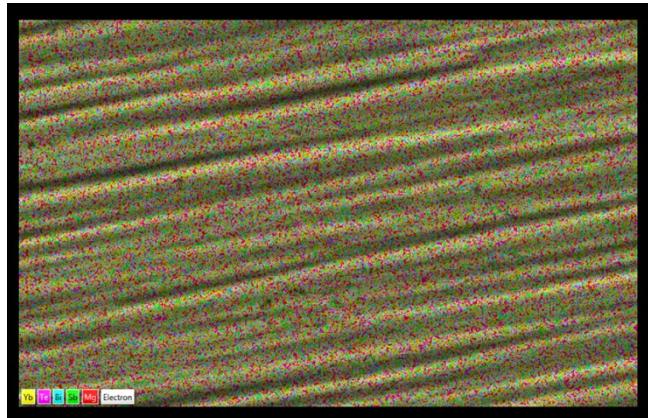


Figure S3: Energy Dispersive Spectroscopy maps of  $Mg_{2.875}Yb_{0.25}Sb_{1.5}Bi_{0.5}Te_{0.01}$



	Nominal Atomic %	EDS Map Atomic %	Uncertainty
Mg	52.0	49.9	2.6
Sb	29.9	31.2	1.1
Te	0.2	0	0.0
Yb	8.0	8.8	0.5
Bi	10.0	10.1	1.0

- Uncertainty based on Standard deviation of composition between different point scans
- Waves in image are residual features left from polishing

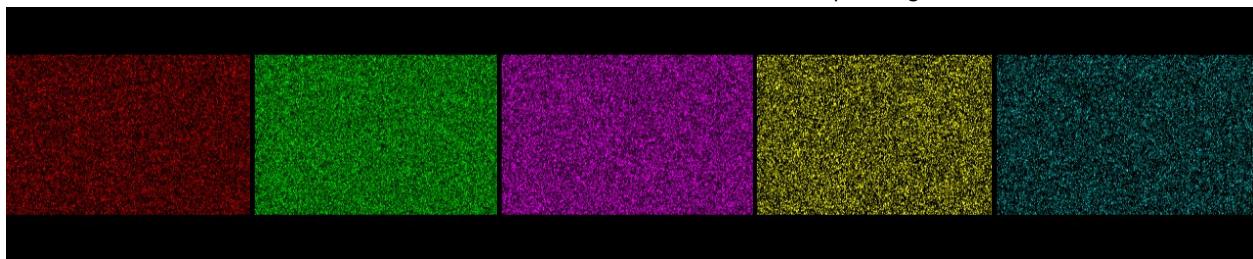


Figure S4: Energy Dispersive Spectroscopy maps of  $\text{Mg}_{2.725}\text{Yb}_{0.4}\text{Sb}_{1.4925}\text{Bi}_{0.4975}\text{Te}_{0.01}$

