Supporting Information

Nano- and microstructure engineering: an effective method for creating high efficiency magnesium silicide based thermoelectrics

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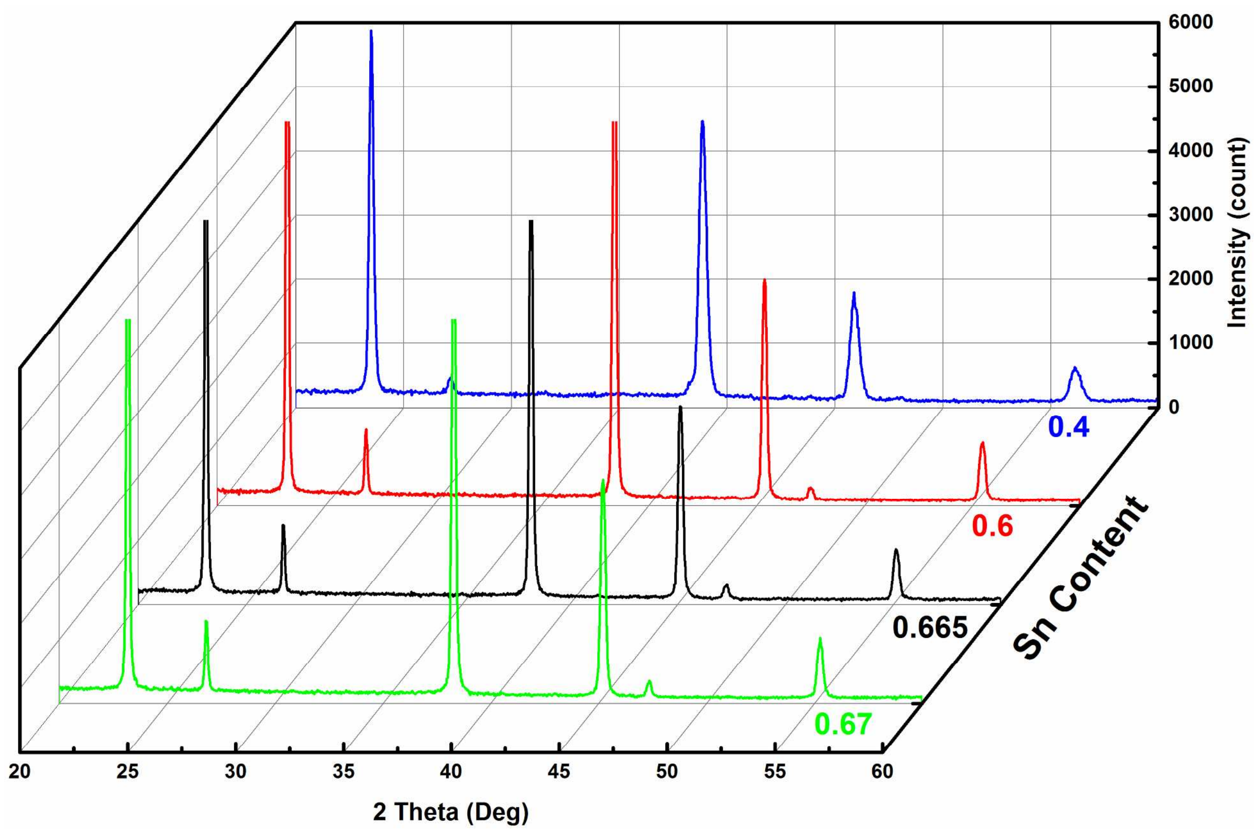

Fig. S1. Powder X-ray diffraction patterns of $Mg_2Si_{1-x-y}Sn_xBi_y$ solid solutions.

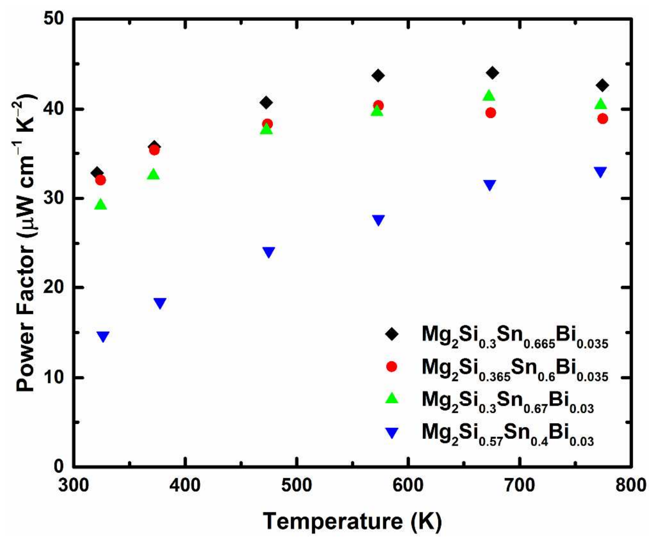

Fig. S2. Power factor of the $Mg_2Si_{1-x-y}Sn_xBi_y$ solid solutions.

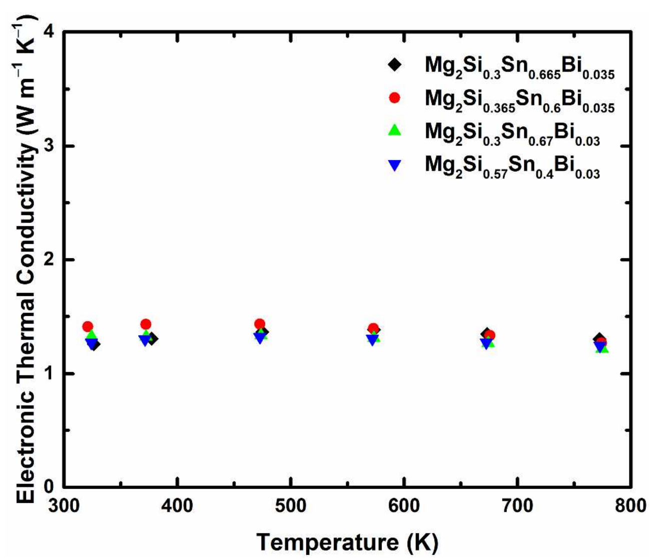

Fig. S3. Electronic thermal conductivity of the $Mg_2Si_{1-x-y}Sn_xBi_y$ solid solutions.

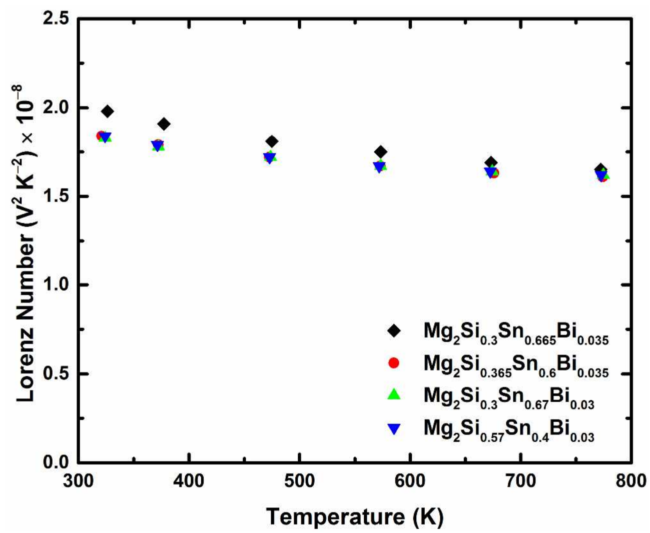

Fig. S4. Calculated Lorenz numbers between 300 K and 800 K of the $Mg_2Si_{1-x-y}Sn_xBi_y$ solid solutions.

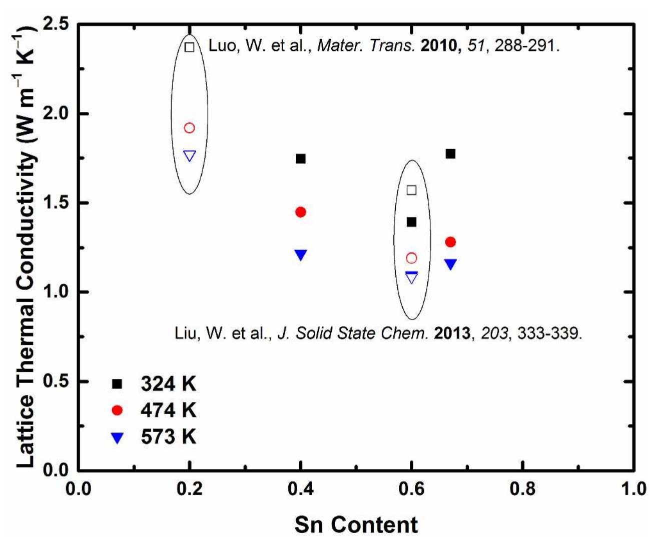

Fig. S5. Lattice thermal conductivity of all samples with respect to Sn content including the reported values for Bi doped $Mg_2Si_{0.8}Sn_{0.2}$ and $Mg_2Si_{0.4}Sn_{0.6}$ samples.

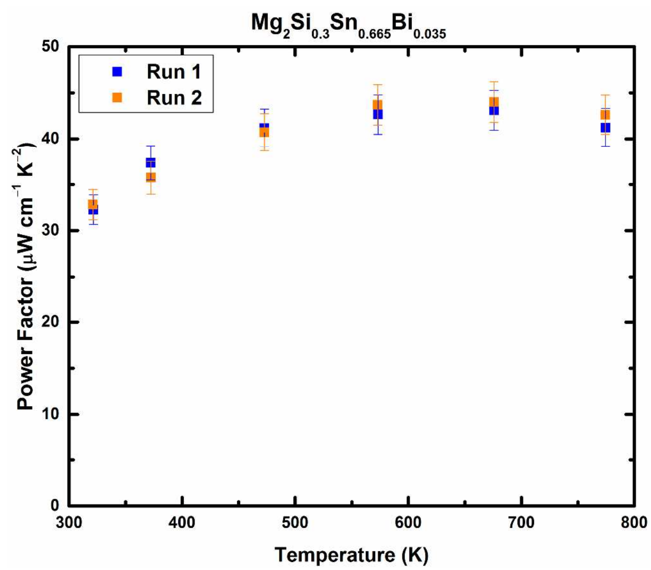

Fig. S6. Power factor of $Mg_2Si_{0.3}Sn_{0.665}Bi_{0.035}$ for two consecutive measurements.

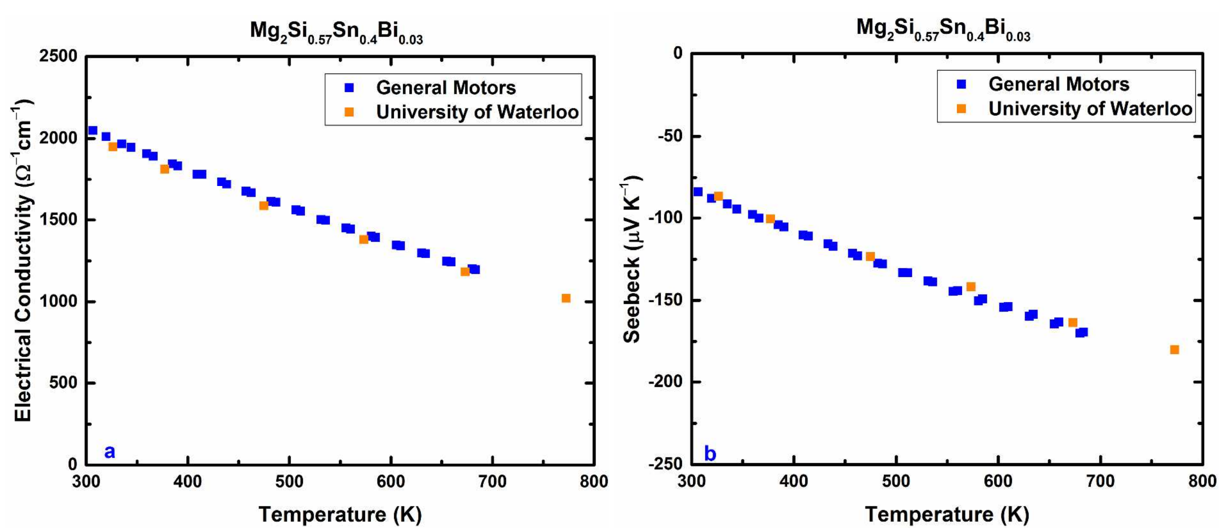

Fig. S7. Electrical conductivity (a) and Seebeck coefficient (b) of $Mg_2Si_{0.57}Sn_{0.4}Bi_{0.03}$ measured at University of Waterloo and General Motors laboratory to examine the consistency of the data.