Supporting Information for

The thermoelectric performance of anisotropic SnSe Doped with Na

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1. The calculated Hall mobility in this work as a function of Ag content (x) at 300 K

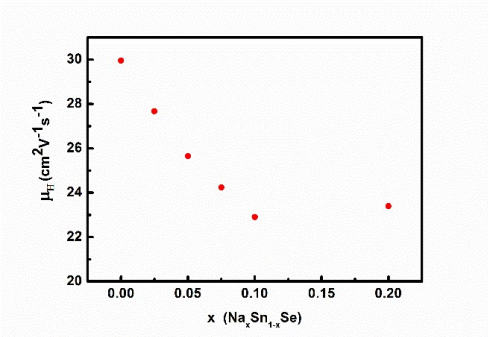

Figure 1 The calculated Hall mobility in this work as a function of Ag content (x) at 300 K.

The calculated Hall mobility decreases with increasing Na content(x) due to the doping Na dopant as the neonatal scattering center and remains stabilized when Na content (x) reaches 0.01.

2. The comparison of thermoelectric property among SnSe based alloys

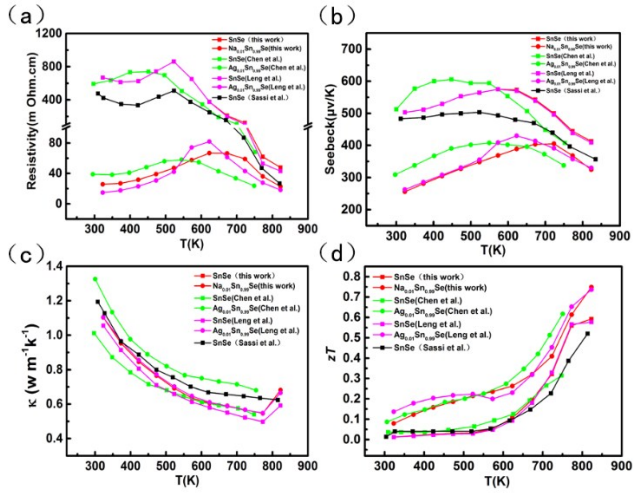

Figure 2 (a) Resistivity (b) Seebeck coefficient (c) Thermal conductivity and (d) zT as a function of temperature for MxSn1-xSe (M= Ag, Na; x=0, 0.01)compounds. Solid squares are the results of SnSe. Solid circles are the results of M0.01Sn0.99Se (M=Ag, Na). The citations are from the results of this work, Chen et al, Leng et al and Sassi et al, respectively.

(1) Butler, M. Photoelectrolysis and physical properties of the semiconducting electrode WO2. *Journal of Applied Physics* **1977**, *48*, 1914-1920.

(2) Zhao, L. D.; Lo, S. H.; Zhang, Y.; Sun, H.; Tan, G.; Uher, C.; Wolverton, C.; Dravid, V. P.; Kanatzidis, M. G. Ultralow thermal conductivity and high thermoelectric figure of merit in SnSe crystals. *Nature* **2014**, *508*, 373-377.