Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Self-propagation High-temperature Synthesis of Half-Heusler Thermoelectric Materials: Reaction Mechanism and Applicability

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$ZrNiSn_{1-x}Sb_x$

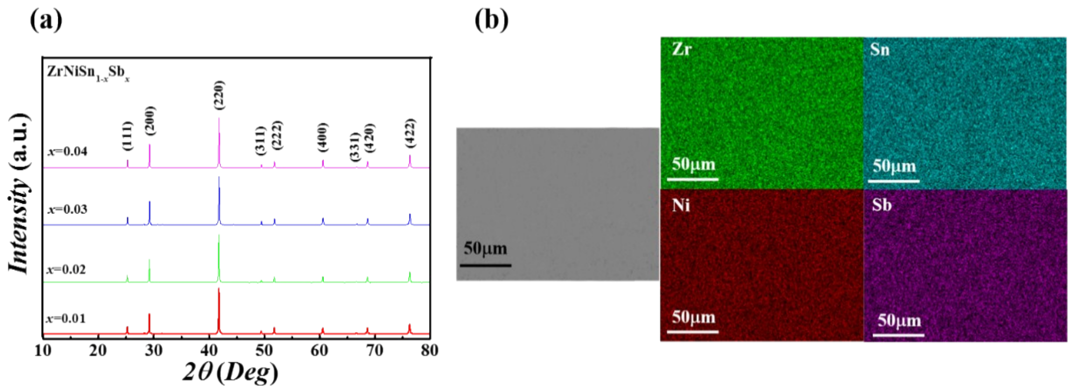

Fig. S1 (a) XRD patterns of the products after SHS-SPS of $ZrNiSn_{1-x}Sb_x$ (x = 0.01, 0.02, 0.03, 0.04) (b) element distribution of the polished surface of $ZrNiSn_{0.99}Sb_{0.01}$ after SHS-SPS

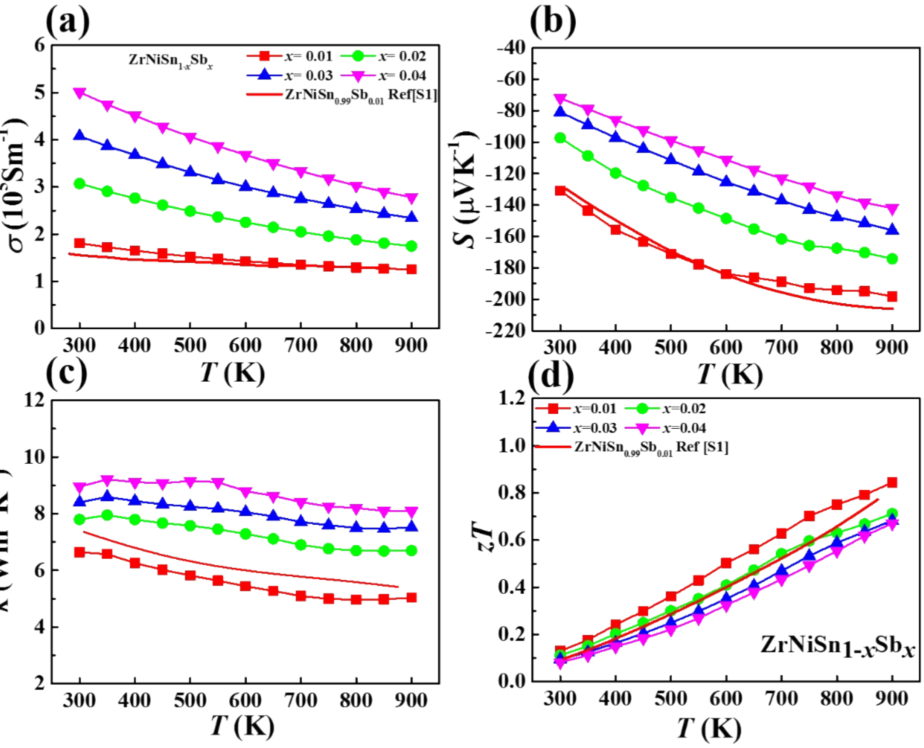

Fig. S2 Thermoelectric performance of SHS-prepared $ZrNiSn_{1-x}Sb_x$ (x = 0.01, 0.02, 0.03, 0.04) (a) electrical conductivity (b) Seebeck coefficient (c) thermal conductivity (d) zT values. The red line represents the data from Ref [S1].

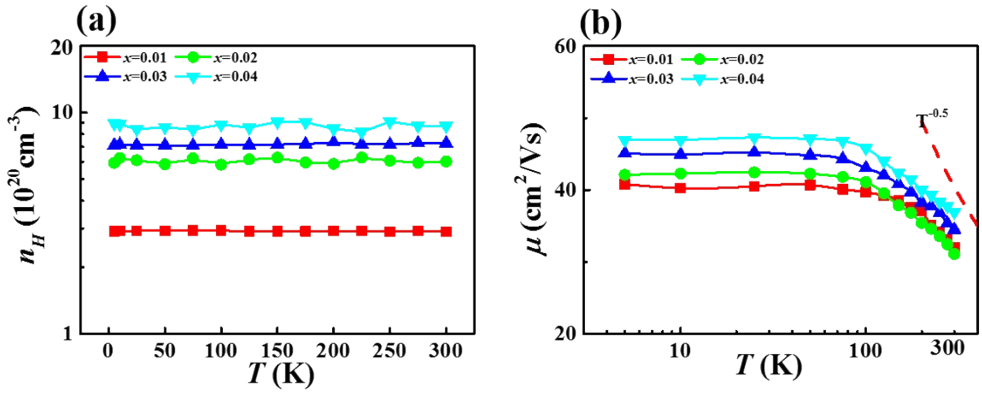

Fig. S3 (a) Hall carrier concentration (b) Hall mobility of $ZrNiSn_{1-x}Sb_x$ (x = 0.01, 0.02, 0.03, 0.04)

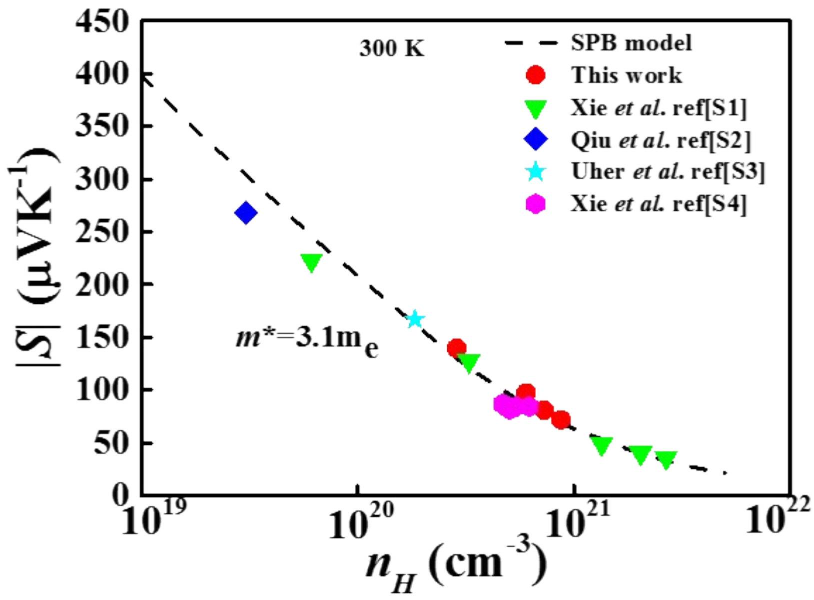

Fig. S4 The Seebeck coefficient of $ZrNiSn_{1-x}Sb_x$ and some reported data[1-4] at 300 K as a function of Hall carrier concentration, the dash line are calculated by the single parabolic band model with $m^* = 3.1\ m_e$

$ZrCoSb_{1-x}Sn_x$

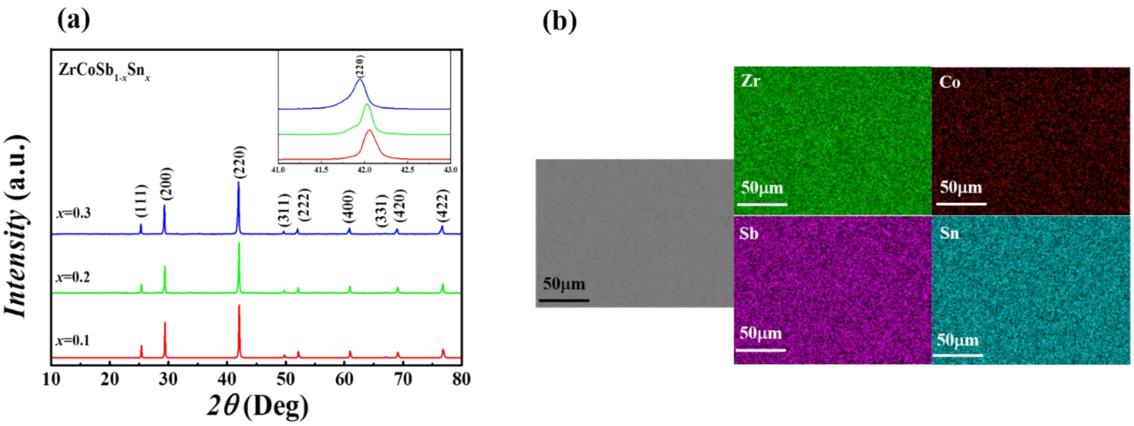

Fig. S5 (a) XRD patterns of the products after SHS-SPS of $ZrCoSb_{1-x}Sn_x$ (x = 0.1, 0.2, 0.3) (b) element distribution of the polished surface of $ZrCoSb_{0.7}Sb_{0.3}$ after SHS-SPS

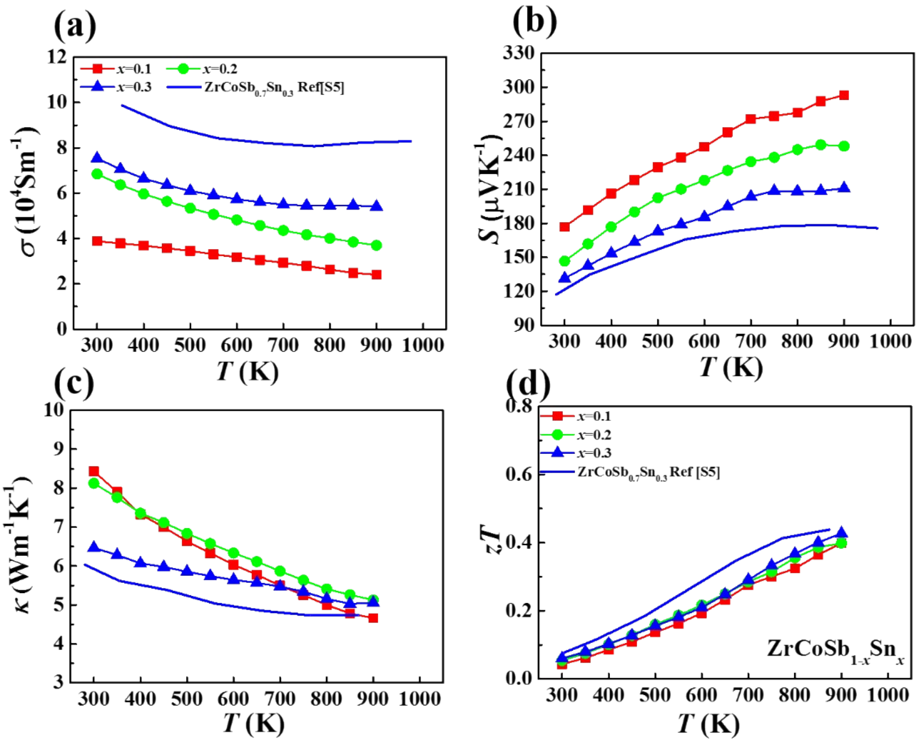

Fig. S6 Thermoelectric performance of SHS-prepared $ZrCoSb_{1-x}Sn_x$ (x = 0.1, 0.2, 0.3) (a) electrical conductivity (b) Seebeck coefficient (c) thermal conductivity (d) zT values. The blue line represents the data from Ref [S5]

$TiNiSn_{1-x}Sb_x$

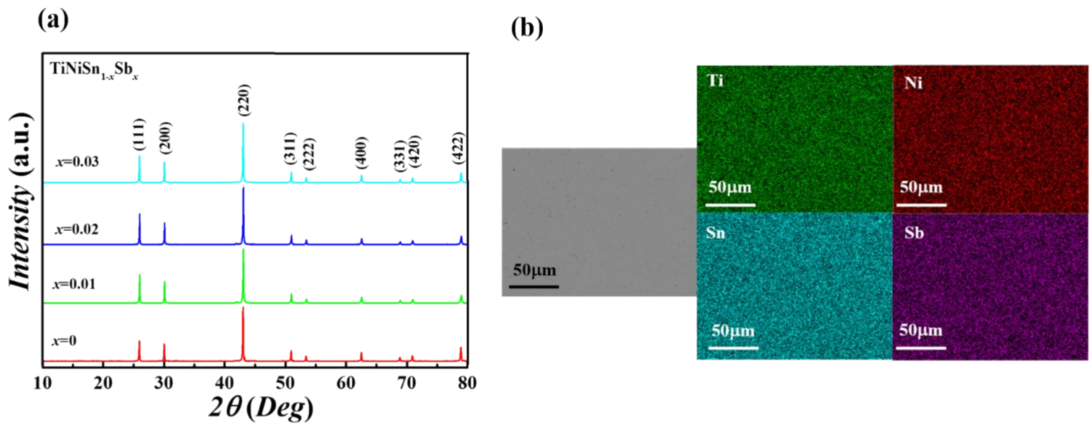

Fig. S7 (a) XRD patterns of the products after SHS-SPS of $TiNiSn_{1-x}Sb_x$ (x = 0, 0.01, 0.02, 0.03) (b) element distribution of the polished surface of $TiNiSn_{0.99}Sb_{0.01}$ after SHS-SPS

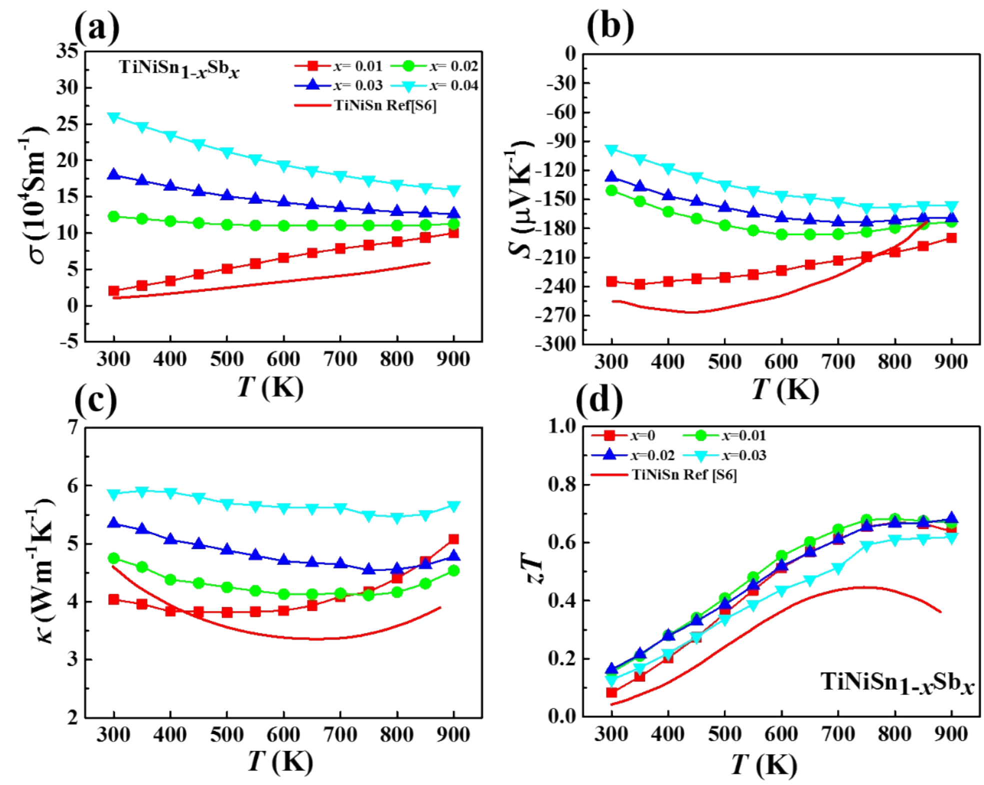

Fig. S8. Thermoelectric performance of SHS-prepared $TiNiSn_{1-x}Sb_x$ (x = 0, 0.01, 0.02, 0.03) (a) electrical conductivity (b) Seebeck coefficient (c) thermal conductivity (d) zT values. The red line represents the data from Ref [S6].

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