— Supplementary Information —

Composition-Dependent Thermoelectric Properties of Hybrid Tin Perovskites $(CH_3NH_3)_xCs_{1-x}SnI_3$: Insights into Electrical and Thermal Transport Performance †

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XRD data

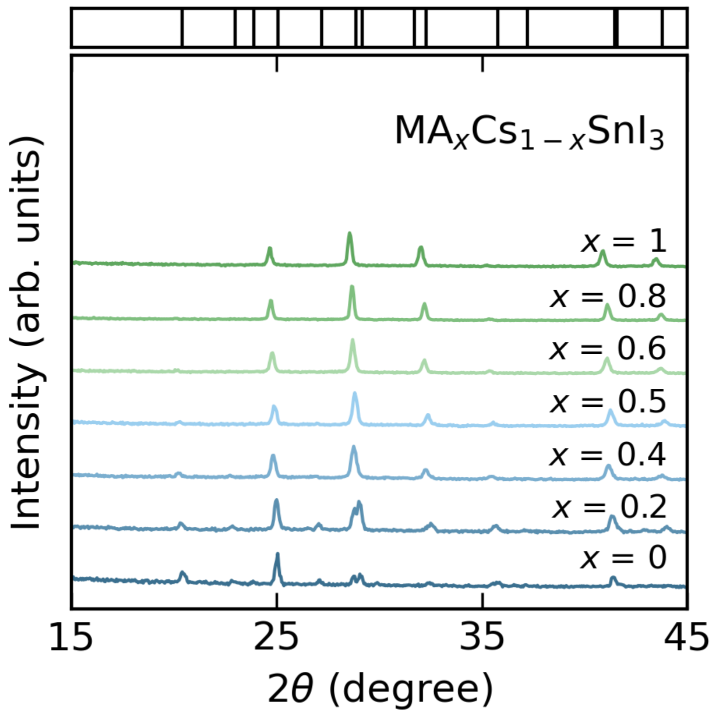

Figure S1: XRD patterns of the $MA_xCs_{1-x}SnI_3$ ($0 \leq x \leq 1$) samples after BM.

XRD data

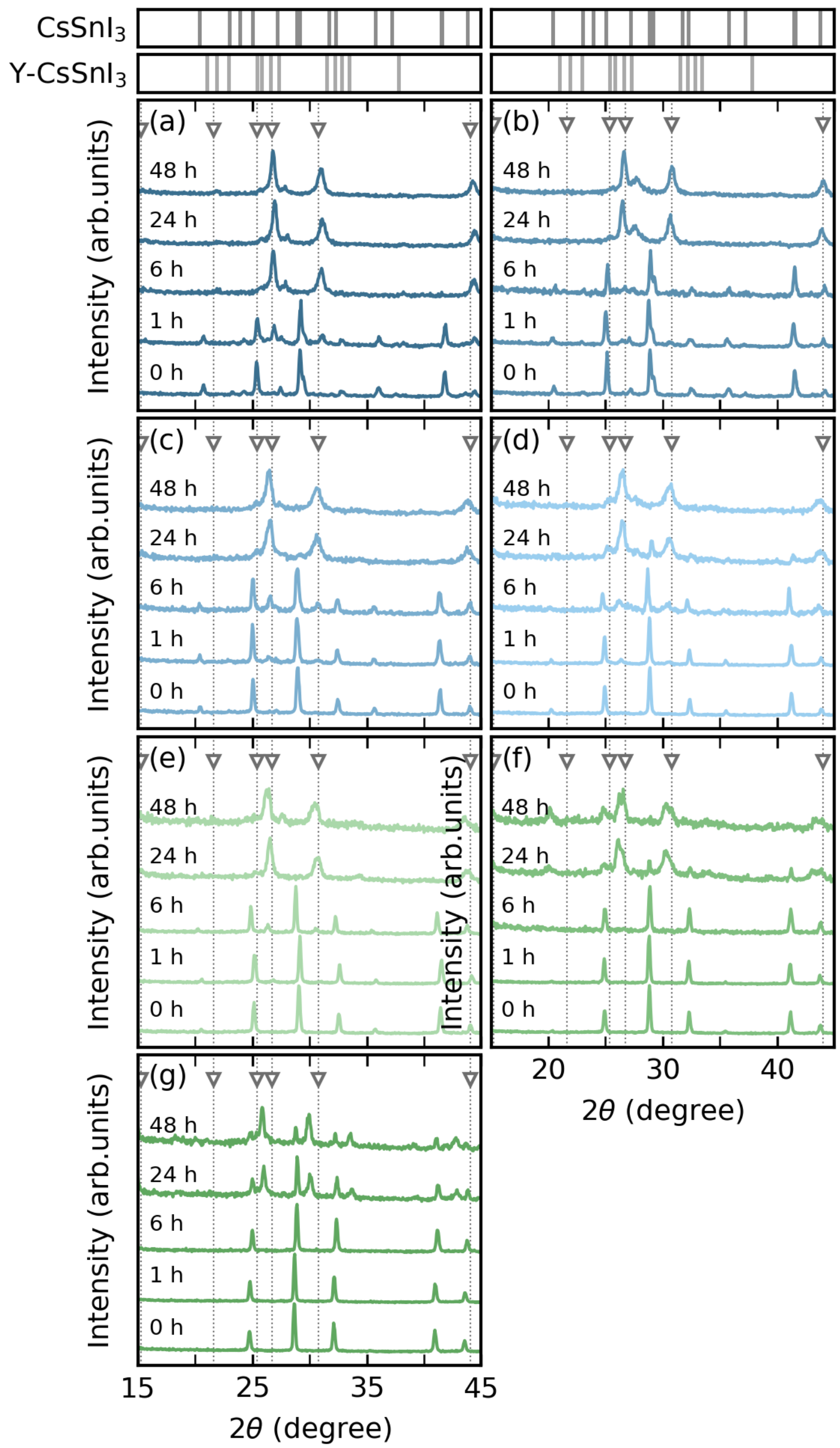

Figure S2: XRD patterns of $MA_xCs_{1-x}SnI_3$ (a) $x = 0$, (b) $x = 0.2$, (c) $x = 0.4$, (d) $x = 0.5$, (e) $x = 0.6$, (f) $x = 0.8$ and (g) $x = 1$ samples after BM+PLS following 0, 1, 6, 24 and 48 hours in ambient air.

SEM images

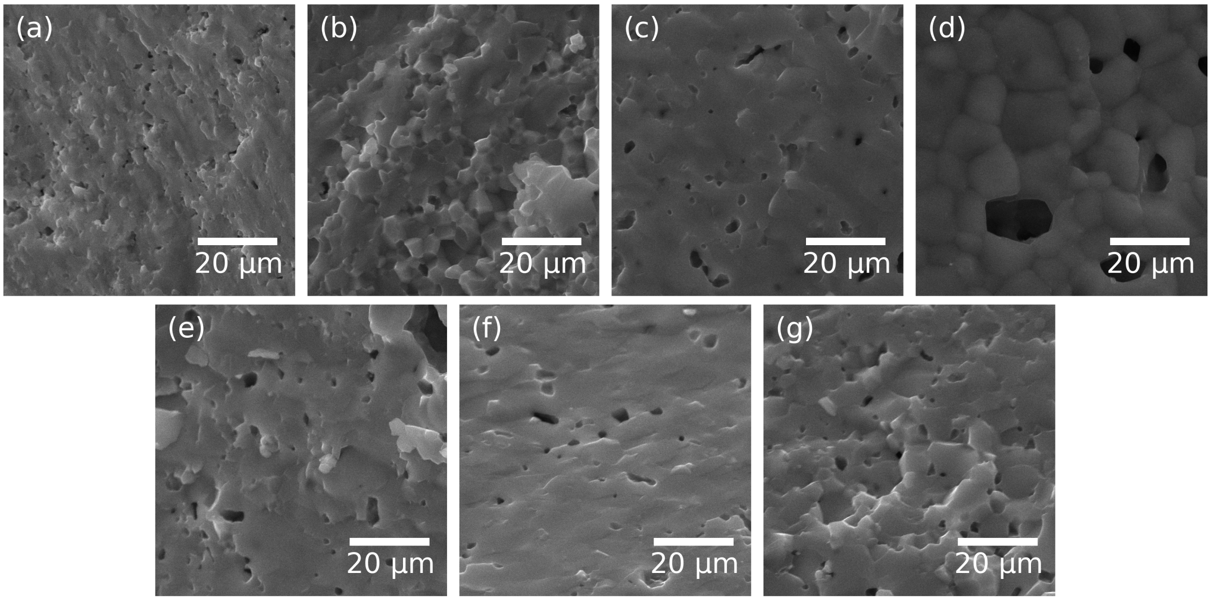

Figure S3: SEM images of $MA_xCs_{1-x}SnI_3$ (a) $x = 0$, (b) $x = 0.2$, (c) $x = 0.4$, (d) $x = 0.5$, (e) $x = 0.6$, (f) $x = 0.8$ and (g) $x = 1$ samples after BM+PLS.

EDX mapping

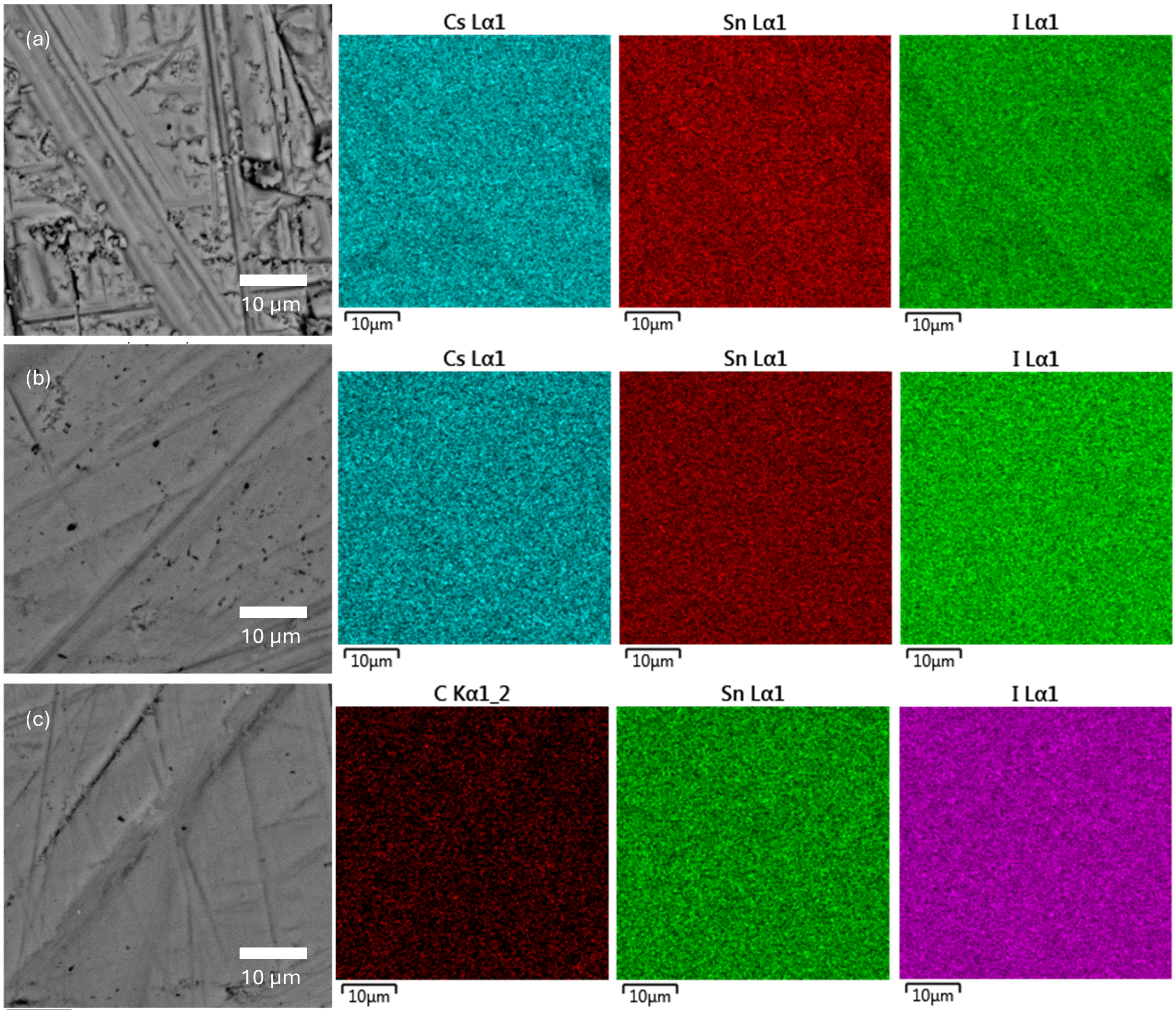

Figure S4: EDX mapping of $MA_xCs_{1-x}SnI_3$ (a) $x = 0$, (b) $x = 0.5$, (c) $x = 1$ samples after BM+PLS.

Thermal transport properties

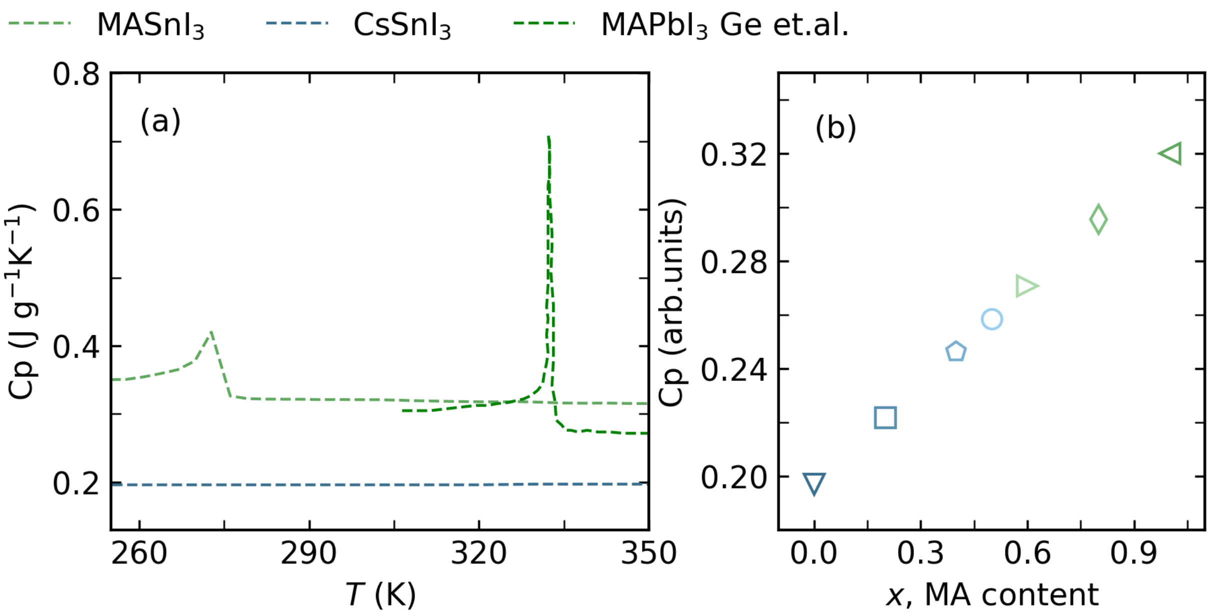

Figure S5: Fig.S4. (a) Temperature dependence of heat capacity for perovskites: experimental data for $MASnI_3$ (PPMS), literature data for $MAPbI_3$,[1] and calculated values for $CsSnI_3$ (Debye model); (b) Composition dependence of heat capacity at 300 K for the $MA_xCs_{1-x}SnI_3$ series.

Comparison with previous reports

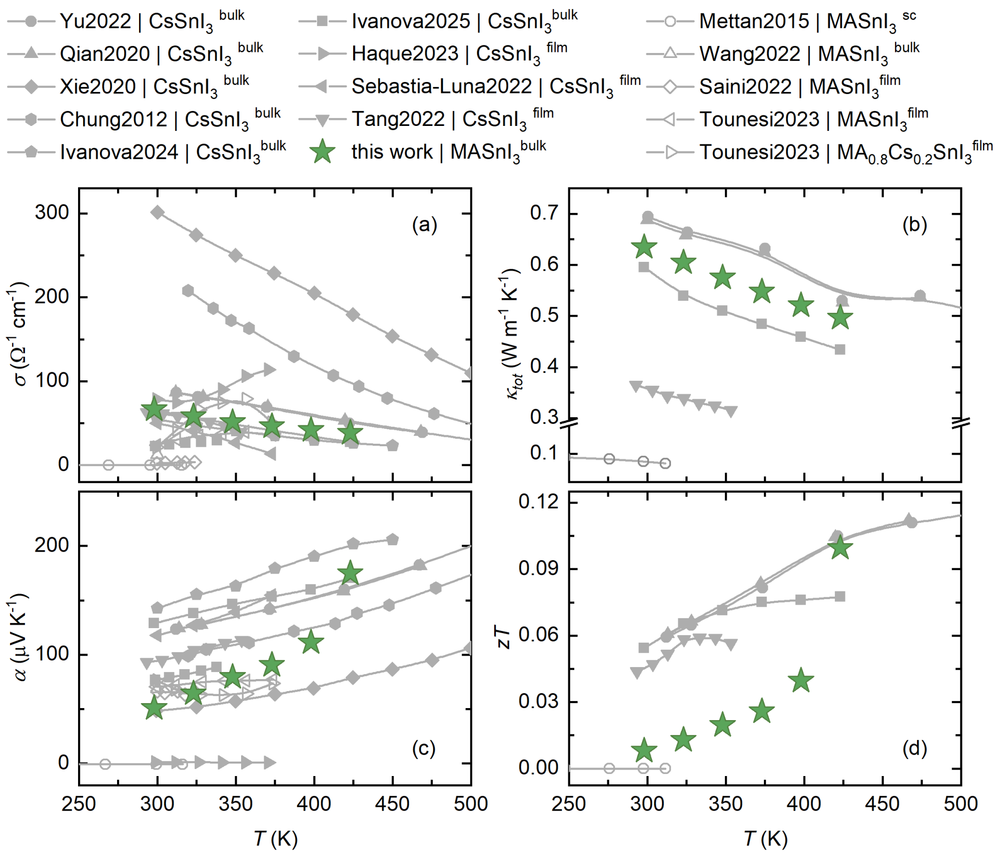

Figure S6: Literature comparison of thermoelectric performance in $MASnI_3$, showing (a) electrical conductivity, (b) thermal conductivity, (c) Seebeck coefficient and (d) thermoelectric efficiency for $CsSnI_3$ (bulks and films; solid symbols) and $MASnI_3$ (bulk, single-crystal and films; open symbols) systems from references and current work.[2,3 4–14]

References

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