Electronic Supplementary Information for:

Scalable colloidal synthesis of $Bi_2Te_{2.7}Se_{0.3}$ plate-like particles give access to high-performing n-type thermoelectric material for low temperature application

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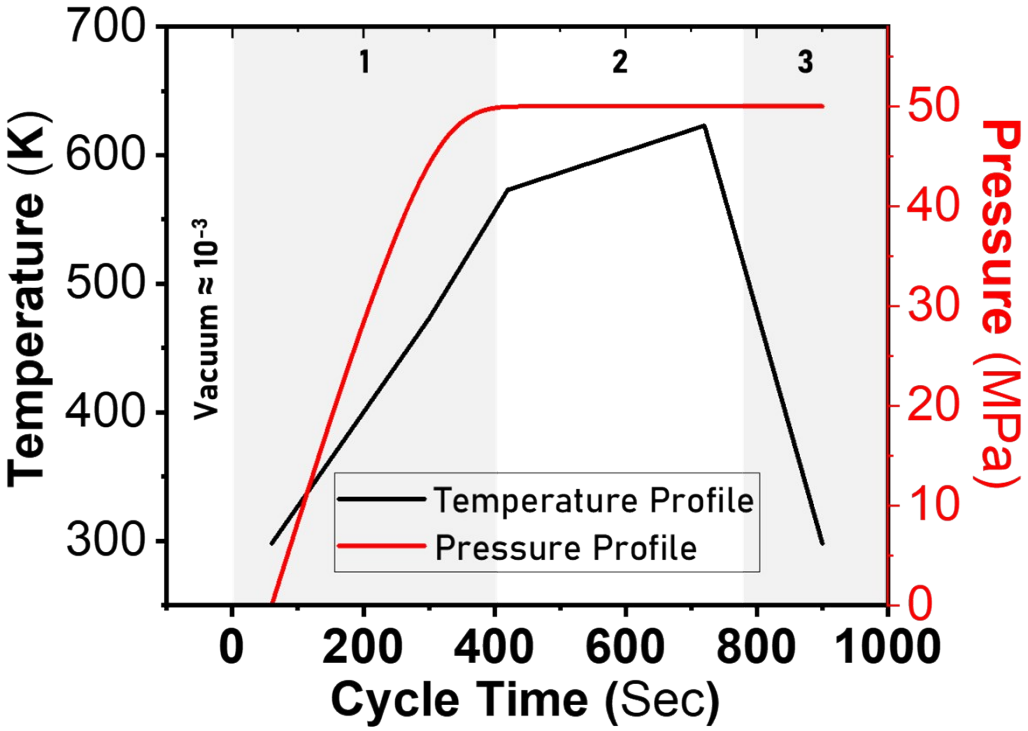

Fig. S1. Sintering profile for spark plasma sintered $Bi_2Te_{2.7}Se_{0.3}$.

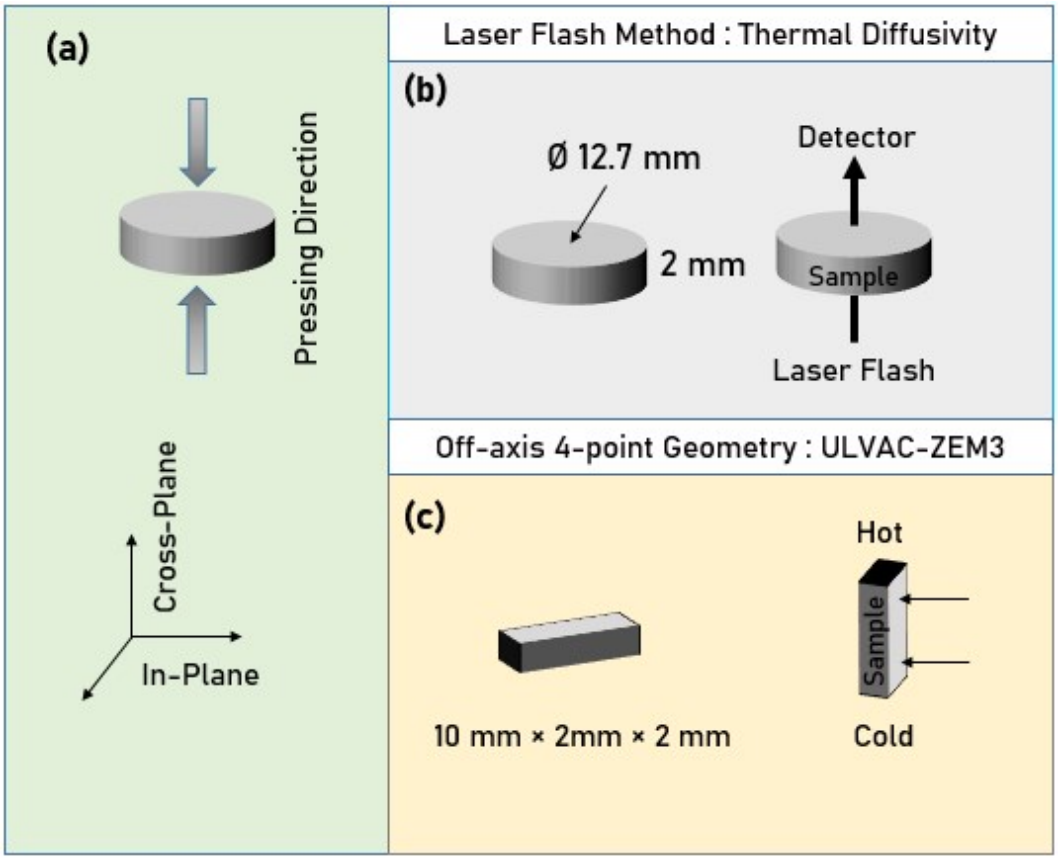

Fig. S2. Schematic representation of direction and geometry for measurement of (a) thermal, and (b) electrical characterisation.

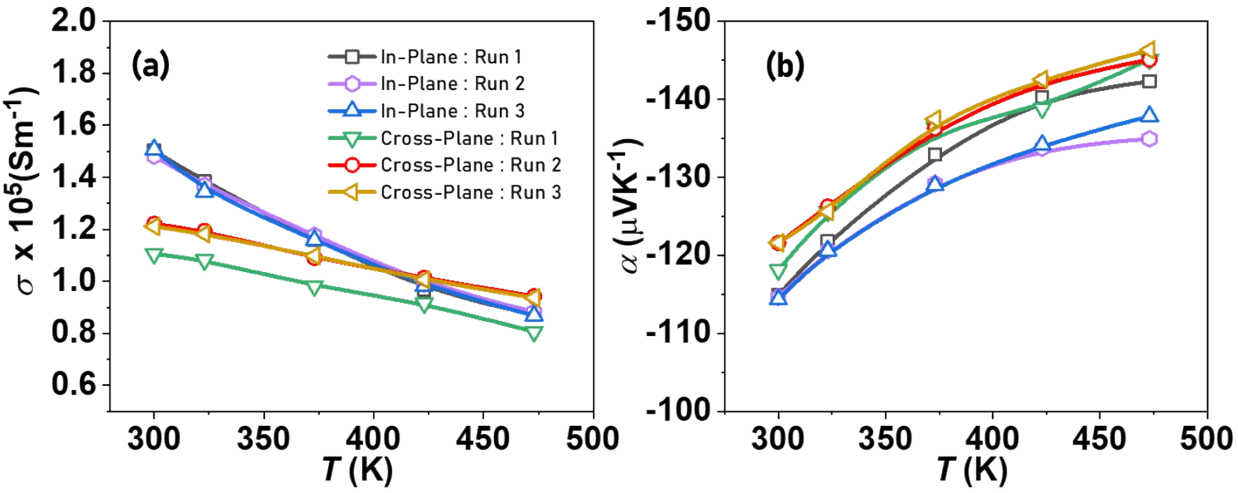

Fig. S3: Repeated measurement of temperature dependent electrical transport for synthesized $Bi_2Te_{2.7}Se_{0.3}$ alloys (a) electrical conductivity, and (b) Seebeck coefficient.

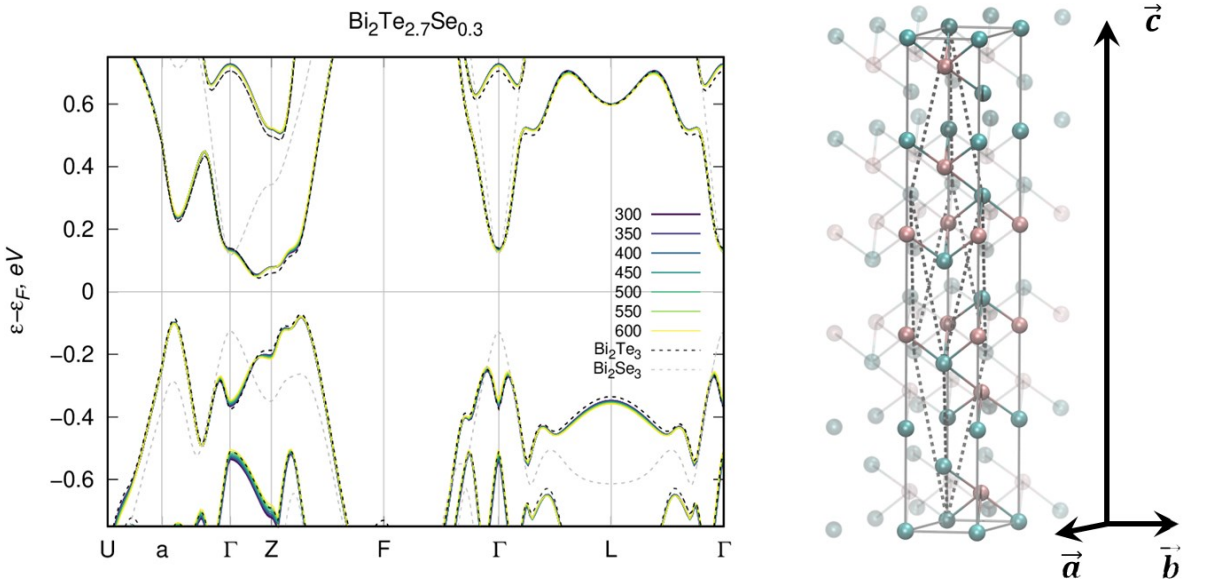

Fig. S4. Left: doping and temperature effect on band structure. Special points correspond to the first Brillouin zone of rhombohedral lattice.[1,2] Right: correspondence between conventional hexagonal (solid lines) and primitive rhombohedral lattice (dashed lines).

References:

1. Setyawan, W.; Curtarolo, S., High-throughput electronic band structure calculations: Challenges and tools. *Computational materials science* **2010,** 49, (2), 299-312.
2. Witting, I. T.; Chasapis, T. C.; Ricci, F.; Peters, M.; Heinz, N. A.; Hautier, G.; Snyder, G. J., The thermoelectric properties of bismuth telluride. *Advanced Electronic Materials* **2019,** 5, (6), 1800904.