

Electronic Supplementary Information

Electrical transport properties of microwave-synthesized $\text{Bi}_2\text{Se}_{3-x}\text{Te}_x$ nanosheet

Haiming Xu, Gang Chen,* Rencheng Jin, Dahong Chen, Jian Pei and Yu Wang

Tab. S1 Elemental atomic wt% (EDS) of Bi_2Se_3 , $\text{Bi}_2\text{Se}_{2.9}\text{Te}_{0.1}$, $\text{Bi}_2\text{Se}_{2.7}\text{Te}_{0.3}$ and $\text{Bi}_2\text{Se}_{2.5}\text{Te}_{0.5}$ single crystals.

Sample (Precursor-ratio)	EDS composition	Bi	Se	Te
Bi_2Se_3	Bi_2Se_3	39.95	59.96	0
$\text{Bi}_2\text{Se}_{2.9}\text{Te}_{0.1}$	$\text{Bi}_2\text{Se}_{2.94}\text{Te}_{0.06}$	39.8	58.9	1.1
$\text{Bi}_2\text{Se}_{2.7}\text{Te}_{0.3}$	$\text{Bi}_2\text{Se}_{2.86}\text{Te}_{0.14}$	39.7	57.1	2.8
$\text{Bi}_2\text{Se}_{2.5}\text{Te}_{0.5}$	$\text{Bi}_2\text{Se}_{2.73}\text{Te}_{0.27}$	39.9	54.5	5.3

Tab. S2 Experimental conditions and electrical transport properties of pure Bi_2Se_3 at 298 K used in this study.

Pressure (Mpa)	Sintered time (s)	Electrical conductivity ($\text{S}\cdot\text{m}^{-1}$)	Seebeck coefficient ($\mu\text{V}\cdot\text{K}^{-1}$)	Power factor ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-2}$)
20	–	106	-118	0.15×10^{-5}
20	6	433	-120	0.62×10^{-5}
20	12	416	-121	0.61×10^{-5}
20	18	423	-120	0.61×10^{-5}
10	–	79	-118	0.11×10^{-5}
10	6	385	-119	0.55×10^{-5}
10	12	382	-120	0.55×10^{-5}
10	18	390	-120	0.56×10^{-5}

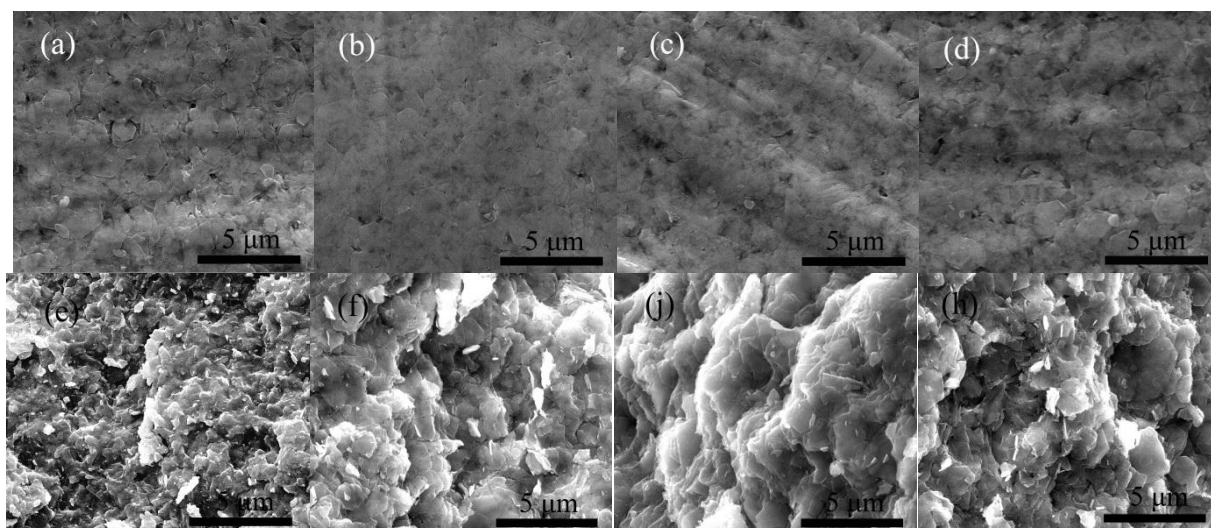


Fig. S1 Surfaces and fractured surfaces of (a, e) green compact, (b, f) 6 s sintered, (c, j) 12 s sintered and (d, h) 18s sintered observed by FESEM, showing the influence of the microwave sintering and/or pressure on the microstructure of Bi_2Se_3 , in the case of a high pressure (20 Mpa).

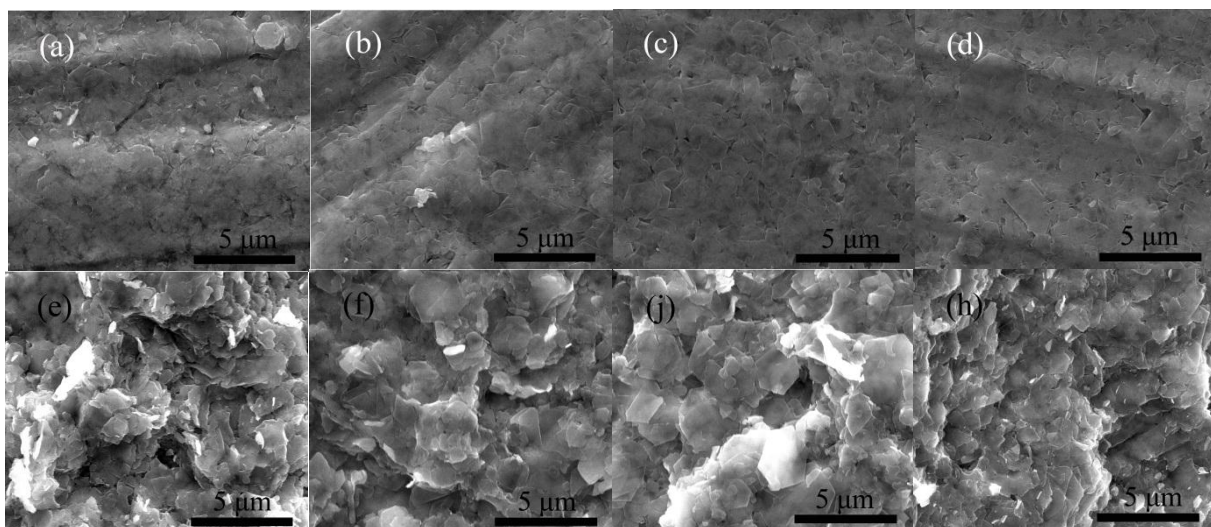


Fig. S2 Surfaces and fractured surfaces of (a, e) green compact, (b, f) 6 s sintered, (c, j) 12 s sintered and (d, h) 18s sintered observed by FESEM, showing the influence of the microwave sintering and/or pressure on the microstructure of Bi_2Se_3 , in the case of a pressure (10 Mpa).

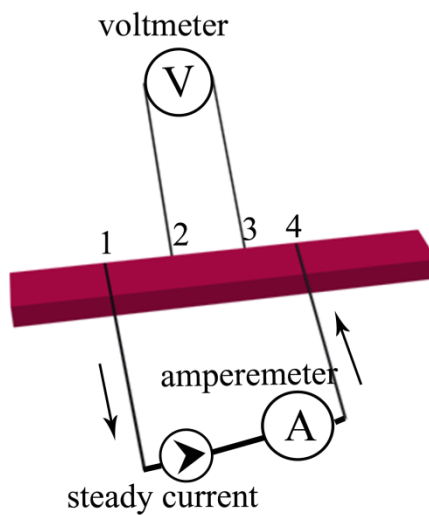


Fig. S3 Schematic diagram of four-probe method for measuring the sample's conductivity.