

Supplementary Information

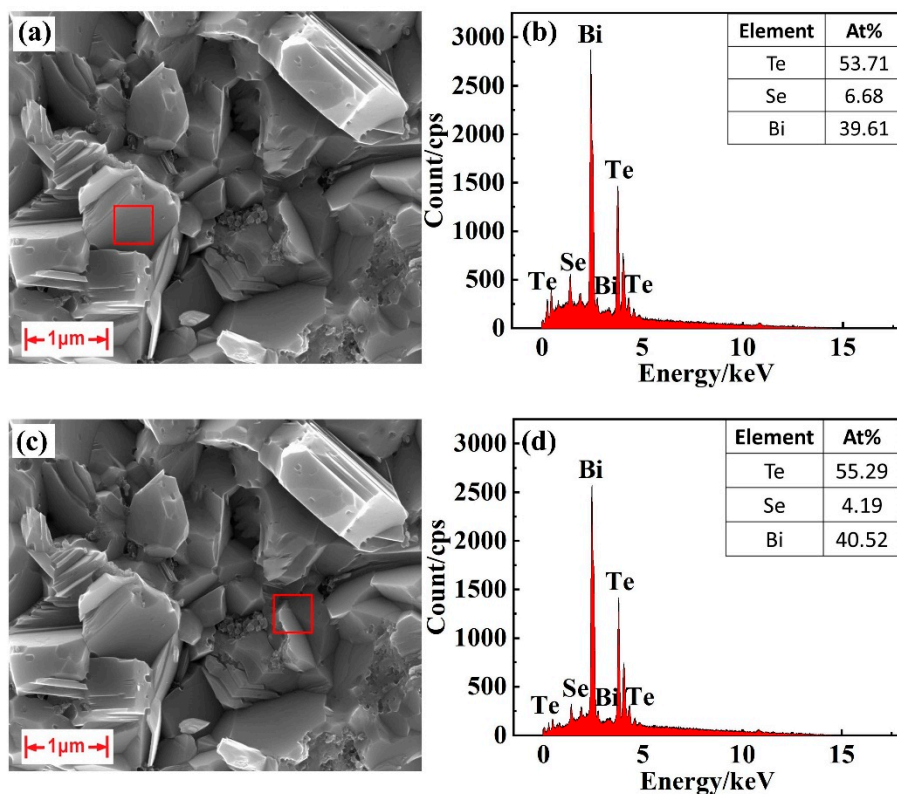


Figure S1. (a,c)SEM images for fractured surface of the the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + 0.7\% \text{TiN}$ sample, (b) EDS of selected region in (a,d) EDS of selected region in (c).

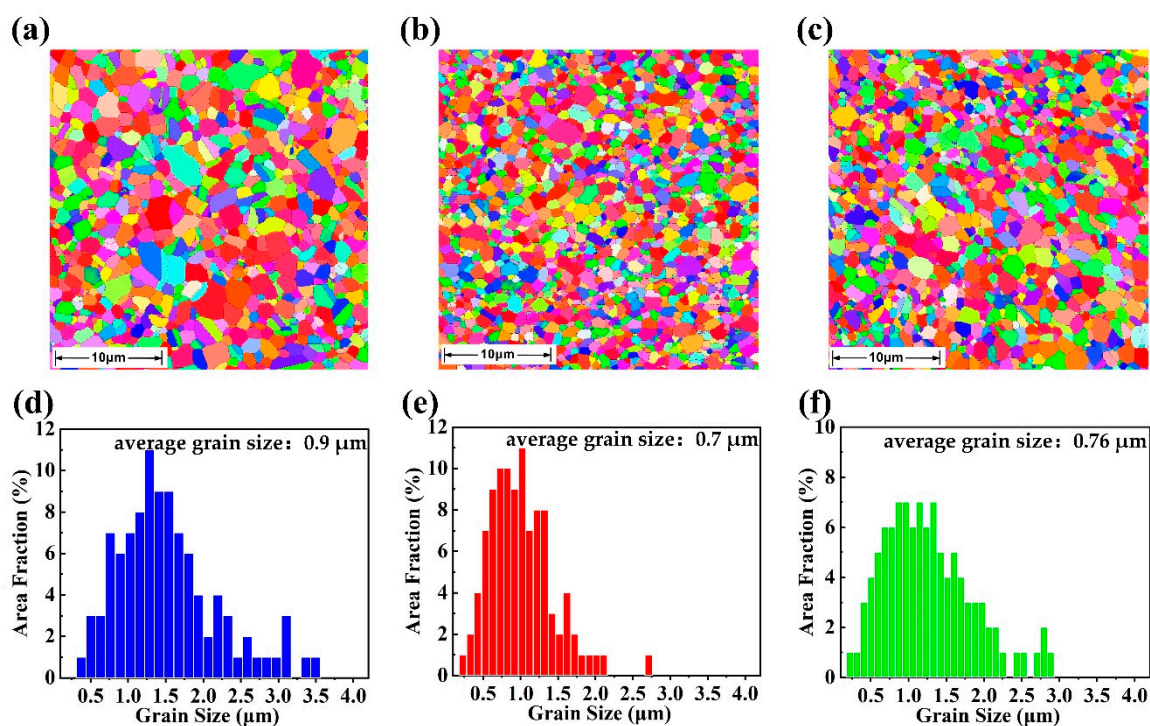


Figure S2. EBSD images of the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + x \text{ wt.\% TiN}$ samples with a) $x = 0\%$, b) $x = 0.7\%$ and c) $x = 1\%$, and the corresponding grain size distributions for the samples with d) $x = 0\%$, e) $x = 0.7\%$ and f) $x = 1\%$.

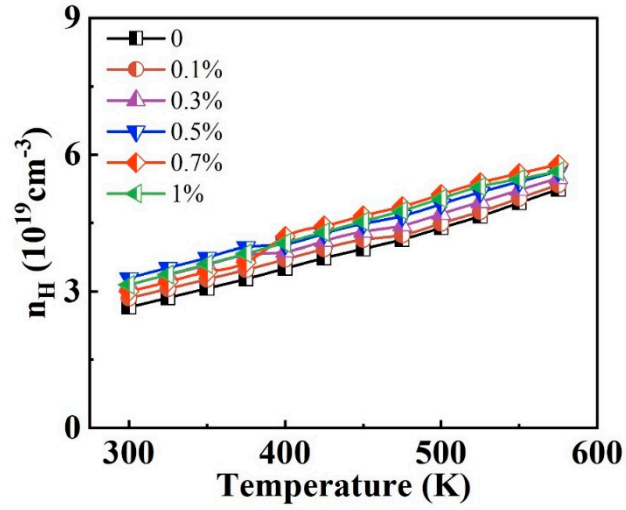


Figure S3. Temperature-dependent carrier concentrations of the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + x$ wt.% TiN samples.

Table S1. Vickers hardness of the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + x$ wt.% TiN samples

x wt.% TiN	Test	Vickers Hardness(GPa)	Average Value(GPa)	Standard Deviation(GPa)
0	1	0.806	0.816	0.0213
	2	0.841		
	3	0.802		
0.1	1	0.831	0.841	0.0381
	2	0.883		
	3	0.809		
0.3	1	0.864	0.874	0.0396
	2	0.917		
	3	0.841		
0.5	1	0.872	0.882	0.0574
	2	0.944		
	3	0.831		
0.7	1	0.973	0.983	0.0259
	2	1.012		
	3	0.963		
1	1	0.916	0.926	0.0226
	2	0.952		
	3	0.911		

Table S2. Bending strength of the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3}$ and $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + 0.7\%$ TiN samples

x wt.% TiN	Test	Bending Strength(MPa)	Average Value(MPa)	Standard Deviation(MPa)
0	1	22.08	22.73	2.46
	2	25.45		
	3	20.65		
0.7	1	37.62	36.19	1.71
	2	34.31		
	3	36.64		

Table S3. Compressive strength of the $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3}$ and $\text{Bi}_2\text{Te}_{2.7}\text{Se}_{0.3} + 0.7\%$ TiN samples

x wt.% TiN	Test	Compressive Strength(MPa)	Average Value(MPa)	Standard Deviation(MPa)
0	1	40.78	44.13	4.19
	2	48.83		
	3	42.79		
0.7	1	74.74	74.48	1.61
	2	75.95		
	3	72.76		