## **Electronic Supplementary Information**

## Enhanced Thermoelectric Performance in Percolated Bismuth Sulfide Composite

Deniz P. Wong<sup>a‡</sup>, Wei-Lun Chien<sup>a,c‡</sup>, Chien-Yu Huang<sup>a,b</sup>, Cheng-en Chang<sup>a,c</sup>, Abhijit Ganguly<sup>b</sup>,

Lian-Ming Lyu<sup>a</sup>, Jih-Shang Hwang<sup>c</sup>, Li-Chyong Chen<sup>b\*</sup> and Kuei-Hsien Chen<sup>c\*</sup>

<sup>a</sup>Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

<sup>b</sup>Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan

<sup>c</sup>Institute of Optoelectronic Sciences, National Taiwan Ocean University, Keelung, Taiwan

<sup>‡</sup> contributed equally

E-mail:

Contents:

- 1. Additional SEM images
- 2. Electrical properties



Figure S1. Scanning electron micrographs of (a) commercial  $Bi_2S_3$  and (b) Bismuth-rich  $Bi_2S_3$  from the hydrothermal method.



Figure S2. Electrical conductivity of  $Bi_2S_3$  composites at 523 K based on various weight ratio of the Bismuth-rich  $Bi_2S_3$  material.



Figure S3. Comparison of electrical conductivity of Bi<sub>2</sub>S<sub>3</sub> composites and directly-sintered Bi<sub>2</sub>S<sub>3</sub> sample.