Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Significantly enhanced thermoelectric performance of Cu-doped p-type $Bi_{0.5}Sb_{1.5}Te_3$ by a hydrothermal synthesis method

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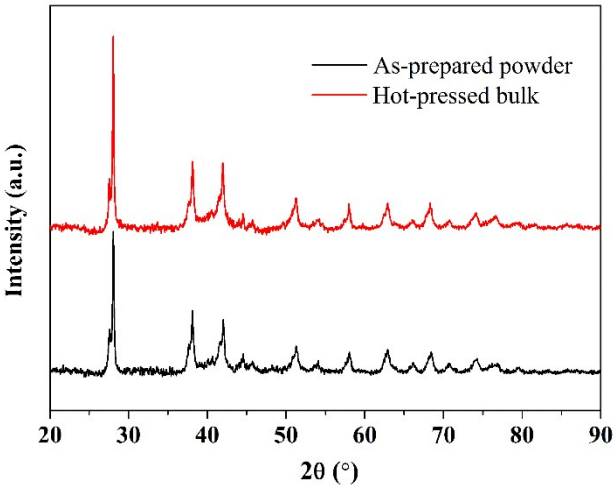

Fig. S1 XRD patterns of Sample S3 (with nominal 1.6 wt% Cu content) before and after hot pressing.

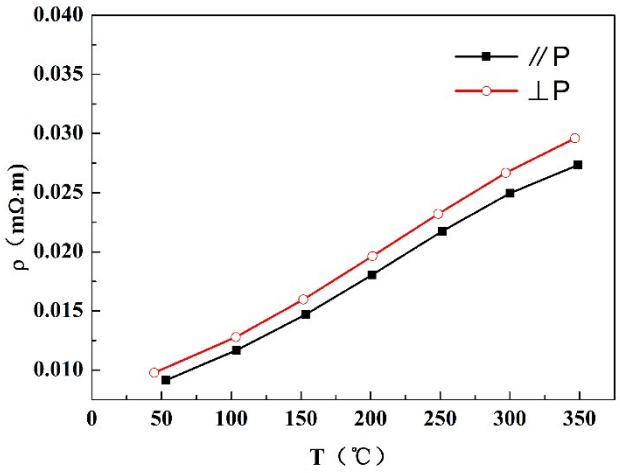

Fig. S2 Temperature dependences of electrical resistivity along the directions parallel and perpendicular to the pressure direction of hot pressing for the $Bi_{0.5}Sb_{1.5}Te_3$ sample with nominal 0.2 wt% Cu.

Fig. S1 shows the XRD patterns of sample S3 (with nominal 1.6 wt% Cu content) before and after hot pressing, and no obvious difference is observed in the two XRD patterns besides the intensities. This indicates that the sample does not show any apparent anisotropy, which might be attributed to the fine powders synthesized by the hydrothermal method as shown in the SEM images (Fig. 3a and 3b). To further clarify the anisotropy in properties, the resistivity has also been measured along the directions parallel and perpendicular to the pressure direction of hot pressing. As shown in Fig. S2, the resistivity parallel to the pressure direction is slightly smaller than that perpendicular to the pressure direction, and the difference is less than 7% in the whole measured temperature range. Considering the measuring accuracy of the resistivity (±10%), it is reasonable to neglect the anisotropy of the sample in this work.

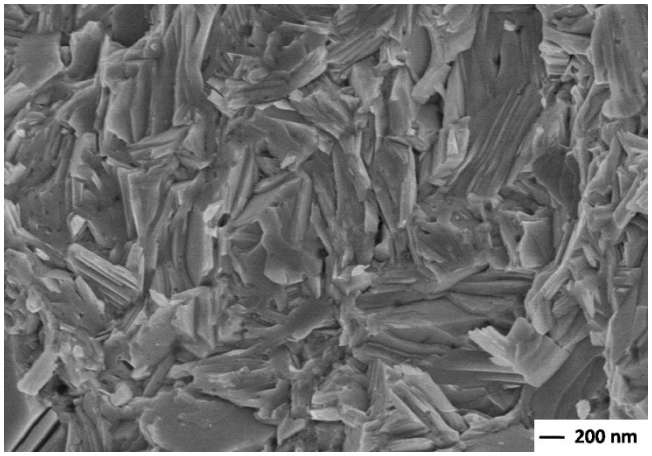

Fig. S3 The SEM image of the cross section of the bulk for sample S3.

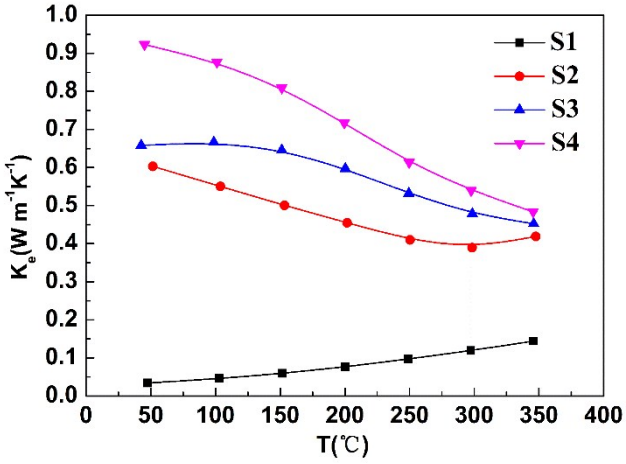

Fig. S4 Temperature-dependent electronic thermal conductivity for undoped and Cu-doped samples.