Supplementary information for:

Effects of Cu addition on band gap energy, density of state effective mass and charge transport properties in Bi_2Te_3 composites

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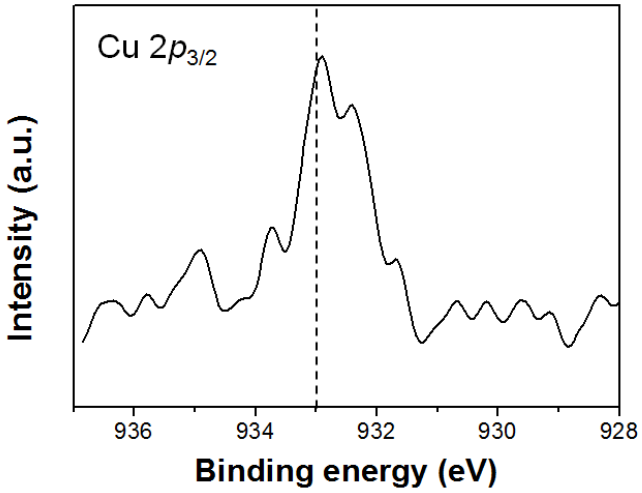
Figure S1. XPS Cu $2p_{3/2}$ spectrum of $Cu_{0.04}Bi_2Te_3$ composite.



Although the XPS spectrum was not very sharp due to the small content of Cu in the composite, the binding energy exhibited a maximum peak around 933 eV and it was quite consistent to the reported values. In literature, the binding energy of Cu has been reported to be ~ 933 eV regardless of its oxidation state (Cu, Cu_2Te, CuTe).[S1~S3] Especially, Teeter reported that the binding energies for Cu^0, Cu^{1+} and Cu^{2+} were equal within about 0.05 eV.[S1] Although the identification of the oxidation state of the doped Cu was not possible due to the similarity in their binding energies, our result clearly reveals the existence of Cu-Te bonding in the $Cu_xBi_2Te_3$ composite.

References

S1. G. Teeter, *Appl. Phys. Lett.*, 2007, **102**, 034504.

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