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**Enhancing figure-of-merit of n-type $\mathbf{Bi_2Te_{3-x}Se_x}$** XIAO YAN, JIAN YANG, YI MA, BED POUDEL, YUCHENG LAN, DEZHI WANG, ZHIFENG REN, QING HAO, GANG CHEN, MIT COLLABORATION — Themoelectric materials with high dimensionless figure-of-merit (ZT) are greatly demanded in energy industry, among which bismuth telluride ($Bi_2Te_3$) exhibits decent ZT around room temperature. However, thermal conductivity of $Bi_2Te_3$ is still high which limits its wider use for low temperature cooling devices. Here we investigate nanostructured bulk n-type $Bi_2Te_{3-x}Se_x$ by reducing the thermal conductivity via increased phonon scattering of the significantly increased grain boundaries due to nano size grains. We first make alloyed nanopowders by mechanical alloying a mixture of elements with the right ratio and then 100% nanostructured samples by hot press.

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