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The Effect of Secondary Phase on Thermoelectric Properties of Zn_4Sb_3 Compound GAOHUA ZHU, WEISHU LIU, Boston College, GANG CHEN, MIT, ZHIFENG REN, Boston College, BOSTON COLLEGE TEAM, MIT TEAM — Zn_4Sb_3 is a promising thermoelectric material because of its high thermoelectric performance and the abundance of Zn and Sb in nature. Samples of Zn_4Sb_3 with ZnSb or Zn as the minor phase were prepared to optimize the figure-of-merit (ZT). The effects of ZnSb or Zn secondary phase on the thermoelectric properties of Zn_4Sb_3 were investigated. The highest peak ZT of about 1.3 was achieved at 400 ^{o}C in the sample with single Zn_4Sb_3 phase, which has the lowest thermal conductivity. Transmission electron microscopy observations of the nanostructures suggest that the precipitated ZnSb, Zn-rich nanoparticles, and nano voids, caused by volatile Zn diffusion, all contribute to the extraordinarily low thermal conductivity.

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