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Enhanced Thermoelectric Figure-of-Merit in p-type Nanostructured Bismuth Antimony Tellurium Alloys Made from Elemental Chunks YI MA, Boston College, QING HAO, MIT, BED POUDEL, Boston College, GMZ Energy, Inc., YUCHENG LAN, BO YU, DEZHI WANG, Boston College, GANG CHEN, MIT, ZHIFENG REN, Boston College, BOSTON COLLEGE TEAM, GMZ ENERGY, INC. COLLABORATION, MIT COLLABORATION — In this study, we use the ball milling and hot press technique to make nanostructured bulk bismuth antimony telluride from elemental chunks of bismuth, antimony, and tellurium. We show that a peak ZT of about 1.3 in the temperature range of 75 and 100 $^{\circ}$C has been achieved. The ZT improvement is caused mostly by the lower thermal conductivity. Transmission electron microscopy observations of the microstructures suggest that the lower thermal conductivity is mainly due to the increased phonon scattering from the increased grain boundaries of the nanograins, precipitates, nanodots, and defects.

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