

Abstract Submitted
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Fabrication and Thermoelectric Properties of Bulk $\text{Si}_{0.8}\text{Ge}_{0.2}\text{-FeSi}_2$ Nanocomposite AMIN NOZARIASBMARZ, Department of Materials Science and Engineering, Helmerich Advanced Technology Research Center, Oklahoma State University, MOHAMED ABUDAKKA, School of Electrical and Computer Engineering, Helmerich Advanced Technology Research Center, Oklahoma State University, LOBAT TAYEBI, Department of Materials Science and Engineering, Helmerich Advanced Technology Research Center, Oklahoma State University, DARYOOSH VASHAEE, School of Electrical and Computer Engineering, Helmerich Advanced Technology Research Center, Oklahoma State University, NSERG TEAM — We report enhancement of thermoelectric figure of merit (ZT) in bulk nanocomposites of n-type $\text{Si}_{0.8}\text{Ge}_{0.2}\text{-FeSi}_2$. The nanocomposite material was prepared via rapid sintering of the mixed powder of $\text{Si}_{0.8}\text{Ge}_{0.2}$ and FeSi_2 in a die under axial pressure. The thermoelectric properties of the samples were measured versus temperature. A remarkable reduction in thermal conductivity was observed while the thermoelectric power factor (Seebeck coefficient squared times the electrical conductivity) was maintained compared to the corresponding properties of the crystalline $\text{Si}_{0.8}\text{Ge}_{0.2}$. As a result the ZT increased to about 1.2 at 950 C, which is 20% more than that of the n-type crystalline silicon germanium.

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