

Abstract Submitted
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Effect of PbSe Nanoparticle Addition on the Thermoelectric Properties of Bulk, Polycrystalline PbTe¹ DIEGO HERNANDEZ, JEFFREY DYCK, John Carroll University, YIXIN ZHAO, CLEMENS BURDA, Case Western Reserve University — Thermoelectric materials are able to convert heat energy into electrical energy and vice versa. Theorists predict that creating nanometer-sized inclusions in traditional thermoelectric materials may improve thermoelectric properties by scattering acoustic phonons, which transmit thermal energy, more strongly than free charge carriers. To study the effect, pellets of bulk, polycrystalline lead telluride with varying concentrations of PbSe nanoparticle additives were prepared by pressing mixed powders. Measurements of electrical resistivity, thermal conductivity, Seebeck coefficient, and Hall mobility were made from 10 K to 300 K. Preliminary measurements found that the thermoelectric figure of merit was not enhanced in samples containing PbSe nanopartiles in the temperature range of our measurements, but further tests may show the true potential of nanostructuring.

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