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Transport Properties of Lead Chalcogenide Nanocomposites GEORGE NOLAS, JOSHUA MARTIN, STEVCE STEFANOSKI, Department of Physics, University of South Florida, Tampa, FL, USA, LI WANG, LIDONG CHEN, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai 200050, China, UNIVERSITY OF SOUTH FLORIDA TEAM, SHANGHAI INSTITUTE OF CERAMICS TEAM — Lead chalcogenide dimensional nanocomposites were prepared by densifying nanocrystals, synthesized in high purity - high product yield employing an alkaline aqueous solution-phase reaction, by Spark Plasma Sintering. Transport properties were evaluated through temperature dependent resistivity, Hall, thermopower, and thermal conductivity measurements. The physical properties of these materials are strongly sensitivity to stoichiometry, doping, and porosity. The transport properties of the nanocomposites were compared to that of bulk polycrystalline materials with similar compositions and carrier concentrations. An enhancement of the room temperature thermoelectric properties of up to 30% over that of the bulk was realized.

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