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Synthesis and Transport properties of Dimensional Nanocomposite Chalcogenides[1] A. DATTA, J. PAUL, A. POPESCU, L. WOODS, G.S. NOLAS, Department of Physics, University of South Florida — Bulk polycrystalline chalcogenides were prepared from chalcogenide nanocrystals synthesized in high yields by a variety of chemical processes. Doping of the nanocrystals allowed for the modification of the carrier concentration in the bulk composites. Densification employing spark plasma sintering dimensionally integrated nanoscale grains within a bulk matrix, resulting in a uniform dispersion of nonconglomerated nanocrystals. Transport properties of the resulting dimensional nanocomposites were evaluated through temperature dependent resistivity, Hall, Seebeck coefficient, and thermal conductivity measurements. These properties were investigated as a function of nanocrystal size and composition. The results are discussed in terms of the potential for thermoelectric applications.

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