Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Electronic Transport Properties of New 2-D Materials GeH and $NaSn_2As_2$[1] BIN HE, Department of Mechanical Engineering, the Ohio State University, Columbus, Ohio USA 43210, NICHOLAS CULTRARA, MAXX ARGUILLA, JOSHUA GOLDBERGER, Department of Chemistry and Biochemistry, the Ohio State University, Columbus, OH 43210, JOSEPH HEREMANS, Department of Mechanical Engineering, the Ohio State University, Columbus, Ohio USA 43210 — 2-D materials potentially have superior thermoelectric properties compared to traditional 3-D materials due to their layered structure. Here we present electrical and thermoelectric transport properties of 2 types of 2-D materials, GeH and $NaSn_2As_2$. GeH is a graphane analog which is prepared using chemical exfoliation of $CaGe_2$ crystals. Intrinsic GeH is proven to be a highly resistive material at room temperature. Resistance and Seebeck coefficient of Ga doped GeH are measured in a cryostat with a gating voltage varying from -100V to 100V. $NaSn_2As_2$ is another 2-D system, with Na atom embedded between nearly-2D Sn-As layers. Unlike GeH, $NaSn_2As_2$ is a metal based of Hall measurements, with p-type behavior, and with van der Pauw resistances on the order of 5mΩ/square. Thermoelectric transport properties of $NaSn_2As_2$ will be reported.

[1]This work is support by the NSF EFRI-2DARE project EFRI-1433467

Bin He
Department of Mechanical Engineering, the Ohio State University, Columbus, Ohio USA 43210

Date submitted: 06 Nov 2015 Electronic form version 1.4