Electronic Transport Properties of New 2-D Materials GeH and NaSn$_2$As$_2$\(^1\) 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$_2$As$_2$. 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$_2$As$_2$ is another 2-D system, with Na atom embedded between nearly-2D Sn-As layers. Unlike GeH, NaSn$_2$As$_2$ is a metal based on Hall measurements, with p-type behavior, and with van der Pauw resistances on the order of 5mΩ/square. Thermoelectric transport properties of NaSn$_2$As$_2$ will be reported.

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