Abstract Submitted
for the NWS14 Meeting of
The American Physical Society

Thermoelectric Properties of $Cu_{12}Sb_4S_{13}$ and Derivatives[1] RODNEY SNYDER, JOSH MUTCH, DANIEL SPEER, CHRIS REIDY, JANET TATE, Oregon State Department of Physics, JOHN WAGER, GREG ANGELOS, Oregon State School of Electrical Engineering and Computer Science, JAESEOK HEO, Oregon State Department of Chemistry — The room-temperature Seebeck coefficient and resistivity of thin film variants of the mineral tetrahedrite $Cu_{12}Sb_4S_{13}$ and its derivatives were measured. In bulk form, tetrahedrite has shown promise as a good thermoelectric material. Thin films of $Cu_{12-x}M_xSb_4S_{13}$ (M = Cu, Zn) were produced by e-beam deposition, and we also produced films with a second metal on the Cu site. The Seebeck coefficients ranged from 10 to 113 μV/K and the resistivity from 8 to 50 mΩcm. Together, these values yield power factors S^2/ρ ranging from 10^{-7} to 10^{-4} W/mK^2, approaching the range of their bulk counterparts at the upper end. As a comparison, the power factors for n- and p-doped silicon were measured and compared to published values. For both p-Si and n-Si, the power factor was $3.0{\cdot}10^{-3}$ W/mK^2.

[1]This project was supported by NSF under DMR-1031153.

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Date submitted: 21 Mar 2014 Electronic form version 1.4