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P-type electronic and thermal transport properties of $Mg_2Sn_{1-x}Si_x$[1] SUNPHIL KIM, Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, OH, BARTLOMIEJ WIENDLOCHA, Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, 30-059 Krakow, Poland, JOSEPH P. HEREMANS, Department of Mechanical and Aerospace Engineering, Department of Physics, The Ohio State University, Columbus, OH — P-type Mg_2Sn doped with various acceptors[(1)(2)] has been studied as a potential thermoelectric material. Because of its narrow band gap and high lattice thermal conductivity, the zT values of the binary compound are limited: zT_{max} reported is 0.3[(3)]. In this work, we synthesize and characterize p-type-doped $Mg_2Sn_{1-x}Si_x$ with various acceptors. Silicon is added in order to widen the band gap and scatter the phonons. The conduction band degeneracy that yields excellent zT in n-type material in the $Mg_2Sn_{1-x}Si_x$ alloy system unfortunately does not apply to p-type material. Thermomagnetic and galvanomagnetic properties (electrical resistivity, Seebeck, Hall, and Nernst coefficients) are measured, along with thermal conductivity and band gap measurements. Finally, zT values are reported. (1) H. Y. Chen et al. Journal of Electronic Materials, Vol. 38, No. 7, 2009 (2) S. Choi et al. Journal of Electronic Materials, Vol. 41, No. 6, 2012 (3) H. Y. Chen et al. Phys. Status Solidi A 207, No. 11, 2523-2531 (2010)

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