Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

High thermoelectric figure-of-merit in Sb_2Te_3/Ag_2Te bulk composites as Pb-free p-type thermoelectric materials MINHO LEE, JONG-SOO RHYEE, Kyung Hee Univ - Suwon Campus, SU-DONG PARK, Korea Electrotechnology Research Institute — We investigated thermoelectric properties of the Sb_2Te_3/Ag_2Te (ST/AT) composites with molar ratios of ST/AT = 1/1, 2/1, 4/1, 8/1, 16/1, and 32/1. The extrinsic composites, synthesized by wet ball milling of two separate powders of Sb_2Te_3 and Ag_2Te, are differentiated with intrinsic composites by high temperature phase separation in that it is low temperature synthesis process. The thermoelectric properties of the composites show systematic behaviour of decreased electrical and thermal conductivities with increasing Ag_2Te dispersion concentration. The ST/AT = 1/1 composite exhibits extremely low lattice thermal conductivity with high power factor over a wide temperature range, resulting in high ZT value 1.5 at 700 K, which is the significantly enhanced value of ZT compared with other Pb-free p-type chalcogenide thermoelectric materials.

Min Ho Lee
Kyung Hee Univ - Suwon Campus

Date submitted: 04 Nov 2015 Electronic form version 1.4