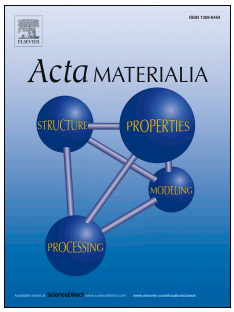
Accepted Manuscript



Significantly enhanced thermoelectric properties of p-type Mg_3Sb_2 via co-doping of Na and Zn

Zhensong Ren, Jing Shuai, Jun Mao, Qing Zhu, Shaowei Song, Yizhou Ni, Shuo Chen

PII: S1359-6454(17)30865-0

DOI: 10.1016/j.actamat.2017.10.015

Reference: AM 14114

To appear in: *Acta Materialia*

Received Date: 12 July 2017

Revised Date: 5 October 2017

Accepted Date: 5 October 2017

Please cite this article as: Z. Ren, J. Shuai, J. Mao, Q. Zhu, S. Song, Y. Ni, S. Chen, Significantly enhanced thermoelectric properties of p-type Mg_3Sb_2 via co-doping of Na and Zn, *Acta Materialia* (2017), doi: 10.1016/j.actamat.2017.10.015.

Significantly enhanced thermoelectric properties of p-type Mg3Sb2 via co-doping of Na and Zn

Zhensong Ren, Jing Shuai, Jun Mao, Qing Zhu, Shaowei Song, YiZhou Ni and Shuo Chen *

Keyword: Zintl phase, Mg_3Sb_2, thermoelectric, power factor, carrier mobility.

Co-doping Na and Zn into thermoelectric compound Mg_3Sb_2 simultaneously improves all the thermoelectric transport properties, conductivity σ, Seebeck coefficient S and reduced thermal conductivity κ, thus leading to significantly higher *ZT* of ~0.8, a 33 % improvement. Importantly, greatly improved power factor in the whole measured temperature range, i.e., 300% at 323 K and 15% at 773 K, respectively, lead to not only the highest average power factor but also the highest output power density for p-type Mg_3Sb_2 even under large temperature gradient in real application.