

Document details

[< Back to results](#) | 1 of 1[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More... >](#)[Full Text](#) [View at Publisher](#)

AIP Conference Proceedings

Volume 2068, 6 February 2019, Article number 020008

International Conference on X-Rays and Related Techniques in Research and Industry 2018, ICXRI 2018; Grand Riverview HotelKota Bharu, Kelantan; Malaysia; 18 August 2018 through 19 August 2018; Code 144871

Effect of acceptor impurity (Cu and Al) in Zn_4Sb_3 thermoelectric materials via hot-isostatic pressing (HIP) method (Conference Paper)Hairin, A.L.N.^a [✉](#), Idris, M.F.^a [✉](#), Othman, R.^b [✉](#), Daud, F.D.M.^a [✉](#), Rozhan, A.N.^a [✉](#), Zaki, H.H.M.^a [✉](#)^aDepartment of Manufacturing and Materials Engineering, Kulliyah of Engineering, International Islamic University Malaysia, Gombak, Selangor, 53100, Malaysia^bDepartment of Science in Engineering, Kulliyah of Engineering, International Islamic University Malaysia, Gombak, Selangor, 53100, Malaysia

Abstract

[View references \(21\)](#)

This project investigates the influence of dopants use via hot-isostatic pressing (HIP) sintering technique on thermoelectric properties. A total of 8 samples weighing 3-g each at different compositions ($Zn_{4-x}M_xSb_3$) ($M = Cu, Al$) ($x = 0, 0.3, 0.6$ at.%) were prepared via powder metallurgy technique and followed by HIP sintering process. The relative density of all the samples recorded 85-95% which is comparable to the published data. From the XRD results, a near single phase of Zn_4Sb_3 was obtained. The SEM images revealed a minor of porous surface exist and showed metallurgical bonding formed in the prepared samples. From thermoelectric properties characterization, Cu showed as an effective element to lower the electrical resistivity as compared to Al when Sample 6 ($Zn_{3.4}Cu_{0.6}Sb_3$) recorded $16.18 \times 10^{-5} \Omega m$ and Sample 8 ($Zn_{3.4}Cu_{0.6}Sb_3$) was $27.09 \times 10^{-5} \Omega m$. The results showed that HIP sintering technique at lower temperature compare to others studies offers potential processing route to produce a good thermoelectric material associated with the doping element. © 2019 Author(s).

SciVal Topic Prominence [i](#)

Topic: Thermoelectric equipment | Thermoelectricity | thermoelectric material

Prominence percentile: 83.961 [i](#)

Funding details

| Funding sponsor | Funding number | Acronym |
|-------------------------------------------|-----------------|---------|
| International Islamic University Malaysia | RIGS16-073-0237 | IUM |

Funding text

The authors would like to thank the International Islamic University Malaysia for funding our research (RIGS16-073-0237).

Metrics [?](#)

0 Citations in Scopus

0 Field-Weighted Citation Impact

PlumX Metrics [v](#)

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)[Set citation feed >](#)

Related documents

Temperature dependence of the atomic structure and electrical activity of defects in ZnSb thermoelectric lightly doped with copper

Prokofieva, L.V. , Nasredinov, F.S. , Konstantinov, P.P. (2017) *Semiconductors*

Optimum operating-temperature range and lifetime estimate for ZnSb:0.1 at % Cu thermoelectrics

Prokofieva, L.V. , Nasredinov, F.S. , Konstantinov, P.P. (2017) *Semiconductors*

Enhanced thermoelectric performance and higher temperature thermal stability of p-type Ag-doped β -Zn₄Sb₃

Song, L. , Blichfeld, A.B. , Zhang, J. (2018) *Journal of Materials Chemistry A*

View all related documents based on references

Find more related documents in Scopus based on: