

Performance of Segmented Thermoelectric Materials Using 'Open-Short Circuit' Technique under Different Polarity

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Abstract : Thermoelectric materials arrange in segmented design could increase the conversion of heat to electricity performance. This is due to the properties of materials that perform peak at narrow temperature range. Performance of the materials determines by dimensionless figure-of-merit, ZT which consist of thermoelectric properties namely Seebeck coefficient, electrical resistivity, and thermal conductivity. Since different materials were arrange in segmented, determination of ZT cannot be measured using the conventional approach. Therefore, this research used 'open-short circuit' technique to measure the segmented performance. Segmented thermoelectric materials consist of bismuth telluride, and lead telluride was segmented together under cold press technique. The results show thermoelectric properties measured is comparable with calculated based on commercially available of individual material. Performances of segmented sample under different polarity also indicate dependability of material with position and temperature. Segmented materials successfully measured under real condition and optimization of the segmented can be designed from the study of polarity change.

Keywords : thermoelectric, segmented, ZT , polarity, performance

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