

Power factor enhancement in Composite Ag-Bi-Ag Planar Thin Film Thermoelectric Structures

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The electrical resistivity and the Seebeck coefficient of Ag-Bi-Ag planar thin film thermoelectric structures are measured, at room temperature, as a function of the length ratio $x=L_{Bi}/L_{tot}$, where L_{Bi} is the length of the Bi layer and L_{tot} is the total length of the structure. The contribution of the interface, formed at the Ag-Bi contact, to the resistivity, the Seebeck coefficient and the thermoelectric power factor of the composite structures is investigated. The experimental results are compared with theoretical predictions obtained by treating the structures as electrical and thermal circuit analogues. An enhancement in the thermoelectric power factor of the structures is observed in the range $0.3 < x < 0.5$. The magnitude of the enhancement is found to depend on the surface area of the Ag-Bi contact.
