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Invitation to Peer Review "Improving Thermoelectric Properties of Bi2Te3 Thin Film via Mn Co-Sputtering." for JoVE (JoVE71082R1)

JoVE Review <em@editorialmanager.com> Fri, Mar 20, 2026 at 11:26 AM
Reply-To: JoVE Review <editorial-office@jove.com>
To: "Vinod S. Khairnar" <khairnar.vinod@gmail.com>

Dear Dr. Khairnar,

We are pleased to invite you to review an original research article submitted to JoVE. Original research articles must show novel findings that bridge gaps in the current scientific literature.

You can find the instructions for authors here.

If you are able to accept this review invitation, please respond within 5 days by clicking the following link: (Agree to Review). If you are a new user on our submission site, you will be prompted to create a password. Once you accept, you will have one week to complete the review.

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Manuscript's details:

TITLE:
Improving Thermoelectric Properties of Bi2Te3 Thin Film via Mn Co-Sputtering.

AUTHORS:
Angella Th'ng; Nurfarhana Ahmad Musri; Puvaneswaran Chelvanathan; Mohd Sukor Su'ait; Nadhrah Md Yatim; Assayidatul Laila Nor Hairin; Ubaidah Syafiq

ABSTRACT:
Until now, Bi_2Te_3 remains as the benchmark for n-type thermoelectric (TE) material for low-temperature energy conversion. However, its small band gap limits efficiency due to charge loss from thermally generated parasitic carriers. Band gap engineering through elemental doping has shown to overcome this issue. Nonetheless, this strategy is currently underexplored for Bi_2Te_3 thin film. In this study, we are doping Bi_2Te_3 thin film with Mn via RF magnetron co-sputtering to modify its structural and TE properties. XRD analysis confirmed the rhombohedral Bi_2Te_3 phase with a preferred (015) orientation. The peaks shifted towards higher 2θ values to indicate Mn replacement at Bi sites with mild lattice compression. Moreover, FESEM imaging revealed dense and uniform grains throughout all samples. Naturally, absolute Seebeck coefficient (S) increases with temperature for all samples. A peak value of 162 μV K^{-1} was achieved for the 15 W sample at 523 K, indicating higher charge production. However, higher Mn doping concentration led to reduced charge transport properties. Thus, 5 W sample attained a higher power factor (PF) of 520 μW m^{-1} K^{-2}, due to significant decrease in electrical resistivity (ρ) combined with good S. These findings show that through careful balance of carrier concentration and mobility, Mn-doping can be optimized during deposition to enhance overall TE properties of Bi_2Te_3 thin films.

You can find the peer reviewer guidelines here, and frequently asked questions (FAQs) about peer review here.

Thank you for considering this invitation.

Best regards,
Pooja Sharma
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