

Abstract Submitted
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Low Temperature Growth of Zinc Oxide Thin Films on Polymer Substrates Using Pulsed Laser Deposition Technique¹ KUN TIAN, BHARATI TUDU², ASHUTOSH TIWARI, Univ of Utah — The emerging technological demand of sleek, foldable and portable devices has raised a huge urge for transparent flexible electronics which requires exploration of new semiconductors beyond silicon. ZnO has the potential to be integrated into flexible electronics matrix due to its excellent electrical and optical properties. Here we report our study on ZnO thin films deposited at low temperature on polymer substrates: Polyethylene Naphthalate (PEN) and Polyimide (Kapton), using pulsed laser deposition (PLD). We have investigated the structural, electrical and optical properties of these films using a variety of techniques. Our studies show ZnO films deposited on Kapton have lower resistivity of $6 \times 10^{-2} \Omega \text{ cm}$ and higher Hall mobility of $124 \text{ cm}^2/\text{Vs}$ compared to the films grown on PEN. Seebeck measurements show ZnO films deposited on PEN have higher Seebeck coefficient than those deposited on Kapton. ZnO films on Kapton show higher photoconductivity which is an order of magnitude higher than that of the films on PEN. To conclude, ZnO films grown on flexible substrates show good electrical and optical properties which can be used in next-generation flexible electronic devices.

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