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Study of optical and electrical assessments of the quaternary MgZnSnO system containing different Mg content

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Abstract

Magnesium zinc tin oxide (MZTO) quaternary systems were prepared using solution-processed method. Assessment of the Mg dopant content of the MZTO quaternary system was done to obtain a better performance of the films in the device applications. The combination of silicon and MZTO system exhibited rectifying behavior. It has been observed that the current in the reverse direction is increased by illumination of 30 mW/cm². The capacitance-time characteristics were measured by transient photocapacitance spectroscopy. The composition of MZTO was studied by absorbance, transmittance and reflectance measurements. It has been seen that the band gap (similar to 4.07 eV) of MZTO films remains almost constant with regard to the increasing Mg dopant content while the thin film of ZTO ternary system without Mg has band gap of 3.9 eV.

Keywords

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