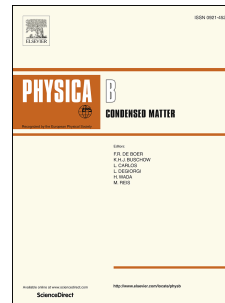


Accepted Manuscript

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PII: S0921-4526(17)30815-3

DOI: [10.1016/j.physb.2017.10.080](https://doi.org/10.1016/j.physb.2017.10.080)

Reference: PHYSB 310437

To appear in: *Physica B: Physics of Condensed Matter*

Received Date: 22 June 2017

Revised Date: 17 October 2017

Accepted Date: 18 October 2017

Please cite this article as: E. Eqbal, E.I. Anila, Properties of transparent conducting tin monoxide(SnO) thin films prepared by chemical spray pyrolysis method, *Physica B: Physics of Condensed Matter* (2017), doi: 10.1016/j.physb.2017.10.080.

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Properties of transparent conducting tin monoxide (SnO) thin films prepared by chemical spray pyrolysis method

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Abstract

Transparent conducting Stannous Oxide (SnO) thin films were obtained by chemical spray pyrolysis method on glass substrates for 0.1M and 0.25M concentration of precursor solutions. Their structural, morphological, optical and electrical properties were investigated. X-ray diffraction (XRD) study shows polycrystalline nature of the films with orthorhombic crystal structure. The morphological analysis was carried out by Scanning electron microscopy (SEM) and elemental analysis was done by Energy dispersive X-ray spectroscopy (EDX). The band gap of 0.1M and 0.25M thin film samples were found to be 3.58eV with 82% transmission and 3eV with 30% transmission respectively. The film thickness, refractive index (n) and extinction coefficient (k) of the films were obtained by ellipsometric technique. Hall effect measurements reveal p-type conduction with mobility $7.8 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ and $15 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ and conductivity of 8.5 Siemens/cm and 17.1 Siemens/cm respectively for the 0.1M and 0.25M samples. Photoluminescence (PL) spectrum of the samples show a broad emission which covers near band edge (NBE) as well as deep level emission (DLE) in the region 380nm-620nm.

Keywords: Thin film; spray pyrolysis; orthorhombic; ellipsometry; chromaticity coordinates.

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