

Synthesis and Characterization of Sol–Gel Screen Printed Gd : ZnO (GZO) Film towards Opto-Electronic Applications

© Preeti Chaudhary, Vipin Kumar[¶]

Department of Physics, KIET Group of Institutions,
Ghaziabad, India

[¶] E-mail: vipinkumar28@yahoo.co.in

Received October 15, 2019

Revised November 12, 2019

Accepted November 12, 2019

In this study, $Gd_{0.02}Zn_{0.98}O$ (GZO) film was coated onto ordinary glass substrate by unusual sol-gel screen-printing procedure. Gadolinium was successfully integrated into ZnO lattice as confirmed by XRD study. The developed film was polycrystalline in nature and displayed hexagonal (wurtzite) structure with favored orientation in [101] direction. SEM picture exposed the formation of fibrous structure on the whole glass substrate. The direct nature of band gap with a value of 3.35 eV was determined by UV-Visible spectrum in reflectance mode. A strong emission peak near the band edge along with weak green emission were exposed by PL spectra. The electrical features of the film were scrutinized by Hall measurement and it was observed that the film showed n-type conductivity with low resistivity value of about $1.07 \cdot 10^{-3} \text{ Ohm} \cdot \text{cm}$.

Keywords: screen-printing, XRD, UV-Visible, resistivity.

Full text of the paper will appear in journal SEMICONDUCTORS.