

Title Deposition and characterization of n type Lanthanum-doped zinc oxide /p-cuprous oxide layers

Authors ALLAG Nassiba , BENHAOUA Boubaker, SAIED Chahnez

1- Abstract

In this study, CuO thin films were deposited by hydrothermal deposition (chemical bath or aqueous solution) methods onto a pure and La-doped ZnO substrat and followed by a thermal oxidation constant temperatures at **300°C** to produce an oxide-based p-n junction. In a previous work , the formation and characterizations of pure and La-doped ZnO thin film with different Lanthanum concentrations (from 1, to 5 wt %) on glass substrates using spray pyrolysis technique at **375 °C** were studied . Our aim is to study and investigate the effect of **CuCl₂.2H₂O** concentration as precursor, annealing process, and the process time during the deposition, while keeping solution temperature at **65°C**, on the structural, morphological, optical, and electrical properties of the prepared thin films. Characterization of p-n junction thin films by X-ray diffraction, Scanning electron microscopy ,UV–Visble ,FTIR Spectroscopy and photoluminescence, respectively, were performed.

The XRD pattern of Cu_xO/ZnO exhibits five diffraction peaks (the **34.47°** correspond to the (002) direction of ZnO and the others additional two peaks at 2θ values of around **35.447°** and **38.684°** which correspond to the (and (002)/ (111) planes of pure monoclinic structure of CuO).No additional peaks related to other phases such as Cu, Cu(OH)₂ or Cu₂O were detected suggesting that the grown CuO are of high purity.

The photoluminescence signal of the thin films CuO showed a narrow band gap of (2.1 eV) . The estimated thicknesses of the CuO layer the crystallite sizes were calculated 69.8 nm .The SEM image indicates that CuO adhere to ZnO s robustly and more stable.

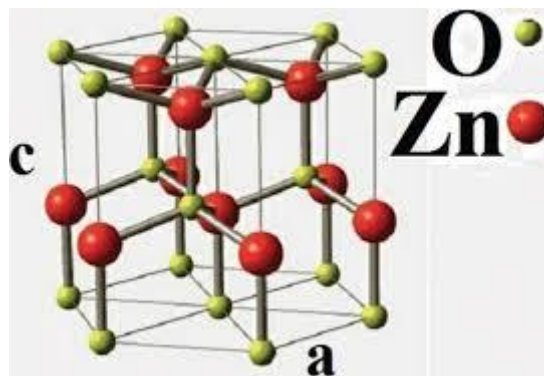
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Key words: Thin films; XRD ,Spray pyrolysis , ZnO, La-doped, Photoluminescence , CuO thin films;

2- Thesis plan

- Bibliography study on the tin oxide of ZnO and its elaboration.
- Elaboration of ZnO thin films by spray pyrolysis.
- The optical characterization (UV-Vis and IR) of the material deposited before and after doping.
- Electrical characterization of the thin films before and after La doping.
- Structural characterization of the elaborate before and after La doping.

3- Abstract Graphic



4- Bibliographic References

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