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M. Salem, I. Massoudi, S. Akir, Y. Litaiem, M. Gaidi, K. Khirouni

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Photoelectrochemical and opto-electronic properties tuning of ZnO films: Effect of Cu doping content

M. Salem[1], I. Massoudi[2], S. Akir[3], Y. Litaiem[4], M. Gaidi[5] and K. Khirouni[1]

[1] Laboratoire de physique des matériaux et nanomatériaux appliqués à l'environnement, Faculté des sciences de Gabes, Département de Physique, 6079 Gabes, Tunisie.

[2] Department of Physics, College of Science, University of Dammam, Dammam 1982-31441, Saudi Arabia.

[3] Centre National de Recherches en Sciences des Matériaux (CNRSM). Technopôle Borj-Cedria, BP 73, 8027 Soliman – Tunisie.

[4] Laboratoire nanomatériaux et système pour les énergies renouvelables (LANSER), Centre de Recherches et des Technologies de l'Energie, Technopole de Borj-Cédria, BP 95, 2050 Hammam-Lif, Tunisie.

[5] Department of Applied Physics, University of Sharjah, P.O. Box 27272, Sharjah, United Arab Emirates.

Corresponding author email: moezsalem40@yahoo.com

Abstract

In this work, **copper (Cu) doped** Zinc oxide thin films **were prepared** by co-precipitation and spin-coating method. Cu doping content was varied up to 5 at. %. Morphological and structural **characteristics** of the synthesized films were analyzed by Atomic Force Microscopy (AFM), X-Ray Diffraction (XRD) and Raman Spectroscopy. XRD measurements **demonstrated** that films were polycrystalline with hexagonal phase. AFM **investigations** revealed uniform repartition of nanocrystallites. Optical band-gap has been tuned from 3.26 eV for undoped ZnO film to 3.19 eV for 5 at. % Cu doped one. Cu doping **revealed** significant effect on the optical **properties**, such as transmission and photoluminescence (PL). An optimum Cu doping of 1 at. % was reported to lead to the highest photoconduction sensitivity, photocurrent density and PL emission intensity.

Keywords: ZnO, Cu doping, Photoluminescence, Photosensitivity.

1. Introduction