

ELECTRODEPOSITION OF ZnO NANOWIRES FOR ENERGY HARVESTING

H. Belkhalifa, N. Dokhan, A. Badidi-Bouda, R. Benzerga

Abstract : Zinc oxide is a transparent n-type semiconductor with a direct bandgap ranging between 3.3 and 3.5 eV. Polycrystalline ZnO has found numerous interesting applications such as piezoelectric transducers varistors , phosphors, transparent conducting films, transparent windows or nanostructured electrode for solar cells. ZnO nanostructures such as nanowires (NWs) and nanorods (NRs) showed attractive characteristics for certain applications ZnO, is among the most interesting materials in terms of piezoelectric properties that are relatively large compared to other non-ceramic piezoelectric materials . It also has the advantage of being easily burn which is of great interest for microtechnology. To get, the ZnO thin films and nanowire must present a good cristallinity with preferential orientation (002) direction. Also, films electrodeposited must have good morphological properties, and NW must show good alignment and have direction of growth perpendicular to the substrate. This work is related to the fabrication of ZnO nanowires and nanorods at room temperature also we showed the influence of the concentration of ZnCl₂ on the morphological and structural properties of the deposits made by electrochemical route (NW and thin films). We made these deposits in an aqueous solution at room temperature and without buffer layer.

Keywords : ZnO, nanowires, thin film, electrodeposition.