

Growth and characterization of ZnO nanorods for optoelectronic applicationM. Mostafa ^{1,#}, S. C. Ghosh ², K. S. Hossain ¹¹ Nanophysics Laboratory, Department of Physics, University of Dhaka, Dhaka-1000, Bangladesh.² Department of Mathematics and Physics, North South University, Dhaka, Bangladesh.#E-mail: mdmostafa3992@gmail.com

Abstract: ZnO nanorods exhibit unique properties like better electro-optical properties and surface morphology from its bulk counterparts. Due to these enhanced properties, ZnO nanorods are now used in wide range of optoelectronic application. In this study, “sol-gel technique” is utilized for the preparation of ZnO colloidal solution, which is then used for hydrothermal growth of ZnO nanorods in a cost effective way. ZnO thin films are prepared using spin coating under different preparation conditions. These samples are then subjected to optical and morphological characterization. Characteristic peaks of XRD and UV-Vis Spectroscopy confirm the existence of ZnO nanorods for samples with different preparation time. It has been found that crystallite size increases with sample preparation time. Absorbance of the samples increases with sample preparation time and rotational speed of spin coater. Moreover, SEM images verify the presence of hexagonal structure of nanorods with different lengths and diameters under different conditions. With longer preparation time, nanorods get larger, thicker and dense. Study reveals that the thickness of nanorods decreases with increasing rotational speeds of spin coater.



Figure 1: SEM image of ZnO nanorods.

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