

ABSTRACT

Zinc Oxide has a wide range of properties that depends on doping, process parameters, fabrication methods and thickness of the thin films. The properties of zinc oxide include high transparency, piezoelectricity, wide band-gap semi-conductivity, room temperature and sensing properties. We can obtain the different nano-structures of ZnO by changing the process parameters in a Plasma Focus Device.

In this research Dense Plasma Focus Device has been used for the deposition of Zinc Oxide thin films on silicon substrate. Zinc has been used as a target and oxygen as a working gas. The XRD peaks confirm the formation of multiphase Zinc Oxide at different angular position of 0° and 10° degree. The crystallinity of ZnO decreased with increasing number of focus shots. Scanning Electron Microscope (SEM) was used to study formation of nanostructures. The results showed that nanostructures becomes denser and show uniformity till 10 number of focus shots but the structures agglomerates at 20 and 30 number of focus shots. The surface morphology and roughness have been studied by the Atomic Force Microscope (AFM). The values of Root Mean Square (RMS) roughness changes with no. of focus shots both at 0° and 10° angular position.