

ABSTRACT

ZnO films were deposited by pulsed dc magnetron sputtering for various deposition times. These films were then characterized by using x-ray diffractometry (XRD), scanning electron microscopy (SEM) and ultraviolet-visible (UV-VIS) spectroscopy. XRD analysis shows that with increase in deposition time crystallinity of the ZnO films is improved. SEM images reveal that by increasing the deposition time smaller grains are merged with each other to form bigger grains. The band gap red is shifted from 3.36 eV to 3.27 eV by changing the deposition time from 3 hours to 5 hours. After the characterization films having deposition time of 5 hours were modified by silver ion implantation. Then modified films are again characterized by XRD, SEM and UV-VIS spectroscopy to study the effect of ion implantation dose. It is observed that crystallinity has decreased by increasing the ion dose. It is also observed that band gap increases dramatically up to a specific ion dose and then is shifted back to its original value with further increase of ion dose.