

## ABSTRACT

ZnO is one of the promising II-VI semiconducting material having a wide bandgap of 3.37 eV and wurtzite structure. It has large exciton binding energy (60 meV), high mechanical strength, high melting point and high transparency to visible light which made ZnO useful for many electronic and optoelectronic devices. In present work, the ZnO thin films have been deposited on Si (100) substrate by Direct Current (DC) reactive magnetron sputtering at different powers. The structural, optical and electrical properties of thin films were examined. Thin films presented highly c-axis orientation with hexagonal wurtzite structure. The structural properties exhibited better crystallinity at 100 W DC power. The crystallite size of film increased up to 100 W then decreased by increasing power and became amorphous at 150 W. The UV-Vis spectrometer was used to analyze the band gap of films which increased by increasing power from 70 W to 100 W and decreased at 150 W. The lowest electrical resistivity was achieved at 100 W then increased gradually at high powers. The photodetection properties were measured for the optimized sample prepared at 100 W. The sample was illuminated by UV light of wavelength 365 nm to get the I-t curve. The I-t curve shows high response time of 43 ms and recovery time of 53 ms.