



Abstract

Nickel oxide (NiO) thin films are deposited on Si substrate by using RF magnetron sputtering system at operating power of 200W. The base pressure is 10^{-5} mbar. The Ar gas is flown with the fixed value of 40sccm flow rate while the flow rate of oxygen is varying from 0.5sccm-2sccm. The optical properties and electrical properties are measured by Spectroscopic Ellipsometry and four-point probe measurement respectively. Surface morphology is analysed by the scanning electron microscopy (SEM). Ellipsometry results show that the band gap of nickel oxide increases with the increase in oxygen flow rate. In SEM micrographs the non-uniform spherical grains are observed with the decrease in grain size with oxygen flow rate. Finally the four-point probe measurements show that the resistivity of nickel oxide thin films decreases with the increase in oxygen flow rate. NiO thin films are annealed at 400°C for one hour. Optical properties after annealing are calculated by using Spectroscopic Ellipsometry. Electrical properties are calculated by Four-Point probe measurement after annealing. Spectroscopic Ellipsometry results show the decrease in band gap values after annealing. The four point probe measurements show the decrease in the resistivity values after annealing.
