

# Magnetron Sputtering Related Parameters Effect On Microstructure and Optical Properties of NiO Films

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## Abstract

Nanocrystalline Nickel oxide (NiO) thin films are one of the very important metal oxides because of its outstanding electrical and optical properties. It has got applications in semiconductor devices, sensors and solar cells. Reactive magnetron sputtering deposition of nickel oxide (NiO) films were done on p-type silicon substrate and glass substrate under Ar+O<sub>2</sub> gas environment under different processing conditions. The phase, crystallinity and grain size were analysed by x-ray diffraction in grazing incidence mode (GIXRD). The average grain size varied in the range of 12 nm to 28 nm for NiO films. The microstructural analysis was carried out under a field emission scanning electron microscopy (FESEM) as well as transmission electron microscopy (TEM). Direct band gap of investigated NiO films were measured with the help of absorption data obtained from UV-visible photospectrometer. The direct band gap was found to vary from  $\approx 2.92$  eV to  $\approx 3.96$  eV with change in NiO films deposition conditions.

## Biography

Dr Mukesh Kumar did his M.Sc. (Physics) from Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur and M.Tech (New Materials and Processing Technology) from Birla Institute of Technology, Mesra, Ranchi. He completed his PhD in research area of Thin Films Deposition and Their Characterizations from IIT Kharagpur. After that he worked as research associate at IISC Bangalore. And post that he joined NIT Jalandhar as an Assistant Professor in the department of physics. Now he is working as an Assistant Professor in department of Physics, Faculty of Physical Sciences, SGT University Gurgaon.



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