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Synthesis and characterization of Nickel oxide (NiO) thin films

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Abstract : For the synthesis of Nickel oxide as thin films, with the spray pyrolysis technical as a chemical method of deposit, on ordinary glass substrates heated to a fixed temperature of 500 °C. we use Nickel nitrate hexahydrate (99.5 %, Aldrich) as source precursor, dissolved in distilled water. Nickel oxide is a p-type semiconductor, is an important material because of its large direct optical gap between 3.6 and 4.0 eV; and easy to deposit in thin layers by many techniques, such as sol-gel and spray pyrolysis. Diagrams of X-ray diffraction (XRD), to confirm the formation of the phase have characterized the structure of the films deposited by the pyrolysis spray technique. Where they showed that NiO are nanoparticle films and have preferred orientations according to (111) and grain sizes in the range of 15 to 48 nm. The surface morphology, absorption domain, molecular vibrations were characterized by scanning electron microscopy (SEM), UV-Visible Spectroscopy and Raman spectroscopy.

Keywords : NiO, Raman, UV-Visible Spectroscopy, XDR