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Physical Characterization of Nickel Doped Nanostructured TiO_2 Thin Films

Abstract

TiO2 and TiO2: Ni films were prepared via spray pyrolysis technique (SPT). XRD measurements assure that film grown by this method was polycrystalline tetragonal structure. The dominant peak was along (110) plane. The grain size of the samples was maximum at the(TiO2:3% Ni)film and it was minimum at the nanocomposite the pure-TiO2, whereas the strain(%) parameter decreases from 35. 35 to 31.13, AFM studies disclosed smooth surface morphology with root mean-square roughness from 8.84 nm to 3.99 nm of TiO2 and TiO2: 3% Ni. AFM image showed that The grain size observed was in the area of 94.37 nm to 59.05 nm with TiO2 and TiO2: 3% Ni nm respectively. spray pyrolysis technique - TiO2 and TiO2: Ni films have optical transmittance in the visible region 95 and 84 %, respectively. Sprayed Spray Pyrolysis Technique TiO2 and TiO2: Ni thin films have optical band gap 3.4 and 3.2 eV respectively.