



Research Article



## Synthesis and characterization of Titanium dioxide nanoparticles and nanocomposites with CdS

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### ABSTRACT

Transition metal oxides possess fundamental and technological properties due to the influence of many

factors such as the presence of d-electrons, crystalline structure, oxygen defects and doped impurities. In view of this work, abundant efforts have been attempted to improve charge separation by modifying the surface or bulk properties of TiO<sub>2</sub>, such as doping, deposition of metals, size reduction and coupling of two semiconductors and thereby improving the photo catalytic activity. Nanocrystal line TiO<sub>2</sub> has unique physico-chemical, optical and electronic properties, excellent pigmentary properties, high ultraviolet absorption and high stability which allow it to be used in biomedical coatings, electro ceramics, self-cleaning surface coating and building materials. Titanium dioxide nanoparticles and nanocomposites elemental studies were carried out using Fourier Transform Infrared Spectroscopy (FTIR) and Energy Dispersive X-ray Spectroscopy (or EDS). Diffraction studies were carried out using X-Ray Diffraction (XRD) Spectroscopy. Microscopic studies were performed by Scanning Electron Microscope and Transmission Electron Microscope. The TGA curve revealed high thermal stability of the synthesized nanoparticles, absence of any impurity or intermediate complex and high melting point.

**Keywords:** Titanium dioxide, Nano composites, FTIR, EDS, XRD and TGA

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