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Novel supported TiO₂ nanocomposites: An efficient photocatalyst for water cleaning technology

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Supported TiO₂ nanoparticles were synthesized by sol-gel method using blue-green phosphor and characterized using X-ray diffraction (XRD), diffused reflectance UV-Visible spectroscopy, Fourier-transform infrared and electron microscopy techniques. The XRD study reveals that the TiO₂ crystal structure does not transform from anatase to rutile phase till 600 °C. Covalent interaction between the phosphor and TiO₂ is evident from the diffuse reflectance spectra showing red shift in wavelength. The band-gap has been tuned to absorb light in the visible range. TEM micrographs of the as-prepared materials revealed presence of well dispersed polycrystalline TiO₂ nanoparticles on the surface of the phosphor substrate. The difference in size of TiO₂ particles that are bonded to the phosphor is attributed to the magnitude of Lewis acid-base interactions between TiO₂ and phosphor support. Photocatalytic activity of as-prepared nanocomposite was investigated by photodegradation of model organic pollutant methylene blue under UV and visible light. The nanocomposite catalyst showed highest photocatalytic activity.

Biography

Dilip R Thube has completed his PhD from Pune University, India. He has been honored with Brain Pool International Fellowship from Korea Research Institute of Chemical Technology, South Korea. He is the Professor of Chemistry at New Arts, Commerce and Science College, Parner, Savitribai Phule Pune University, India. He has over 40 publications and has been serving as an Editorial Board Member of reputed journals.

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