



Enhancement of Photodegradation of Picric Acid (2,4,6-Trinitrophenol) by Fabrication of Visible-Light-Active SnO₂ Quantum Dots/TiO₂ Nanospheres Composite

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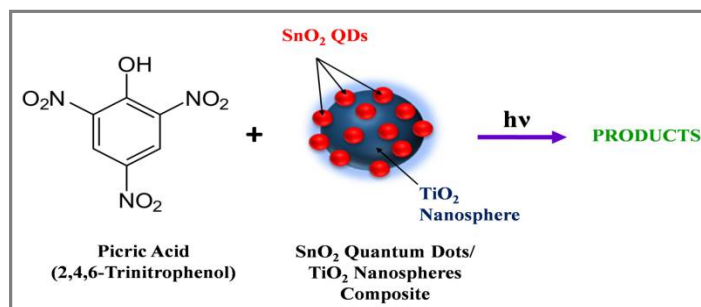
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ABSTRACT

Environmental pollution and energy crisis have become recent worldwide concerns. Currently water pollution is presenting the most serious global concerns. Huge amounts of organic wastes are discharged into water bodies, causing serious environmental pollution. SnO₂ quantum dots/TiO₂ nanospheres composite frameworks are excellent candidates as photocatalyst due to their strong visible-light absorbing ability, high tunability, high specific surface areas and semiconductive properties. Herein, a visible-light driven SnO₂ quantum dots/TiO₂ nanospheres composite has been prepared by bottom-up approach. The effect of various parameters such as pH, concentration of dye, amount of semiconductor and light intensity on rate of degradation was observed. The photocatalytic behavior of as-synthesized samples shows better activity than pure TiO₂ nanospheres. This study presents a choice for potential applications of quantum dots (QDs) in treatment of wastewater containing organic contaminants.

Graphical Abstract



Keywords: Quantum Dots, Endocrine Disrupting Chemicals (EDCs), Picric Acid, 2,4,6-Nitrophenol Degradation, Nanoparticles, Photocatalyst, Waste water treatment