

Visible light activity of sulfur doped TiO₂ nanoparticles prepared by one step process

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The present research work emphasizes a new approach to prepare sulfur doped TiO₂ nanoparticles by one step chemical process. The main intent of this work is to reduce the demerits of sulfur (S) doped TiO₂ nanoparticles preparation, in requisites of the simple, cost effective, and mass preparation parameters. The physicochemical properties of undoped and doped TiO₂ were emphasized by XRD, FTIR, UV-Vis, PL, SEM with EDS and TEM analysis. The observed results shows the smaller crystallite size (10–12 nm) with spherical morphology of individual grains based on the XRD, SEM and TEM analysis results. From the UV-Visible and PL analyses, it observed that the S doped TiO₂ has been improved the UV and Visible absorption. The optimized results were exhibits sulfur doping escalating the photogenerated electrons and holes during the photocatalytic reaction. The obtained nanoparticles can be utilized in photovoltaic devices as photoanode material.

Keywords: Sulfur doped TiO₂, visible light active, single step process, photocatalytic.