

Application of plasmonic metal nanoparticles in TiO₂-SiO₂ composite as an efficient solar-activated photocatalyst: A review paper

ABSTRACT

Over the last decade, interest in the utilization of solar energy for photocatalysis treatment processes has taken centre-stage. Researchers had focused on doping TiO₂ with SiO₂ to obtain an efficient degradation rate of various types of target pollutants both under UV and visible-light irradiation. In order to further improve this degradation effect, some researchers resorted to incorporate plasmonic metal nanoparticles such as silver and gold into the combined TiO₂-SiO₂ to fully optimize the TiO₂-SiO₂'s potential in the visible- light region. This article focuses on the challenges in utilizing TiO₂ in the visible-light region, the contribution of SiO₂in enhancing photocatalytic activities of the TiO₂-SiO₂ photocatalyst, and the ability of plasmonic metal nanoparticles (Ag and Au) to edge the TiO₂-SiO₂ photocatalyst toward an efficient solar photocatalyst. © 2021 Joseph, Taufiq-Yap, Musta, Sarjadi and Elilarasi.