

Photocatalysis Degradation of Oil-Polluted Water Enhancement via Pickering Emulsion Stabilized by TiO₂

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Pickering Emulsions (PE), which received growing endorsement in the recent catalytic chemistry field due to its high surface activity, provide new possibilities to improve the efficiency of TiO₂ light catalysis in degrading soluble pollutants in water. In this study, the PVA-hybridization method and methyl orange pretreatment are utilized to change the photoresponse to visible light spectrum and wettability of nanoparticles to form the emulsion. In this sense, a Pickering Emulsion system stabilized by PVA hybridized, methyl orange pretreated TiO₂ nanoparticles is obtained and has both visible light photoreaction and optimal photocatalysis capabilities. The experimental results showed that the catalyst obtained by this method achieved a high visible light catalytic activity and persistence by completely degrading the configured methyl orange solution within 3 h for the first time under experimental conditions under long-term visible light irradiation and only 34.98% volume expansion after 9 h continuous irradiation. The model designed in the paper enhances the ability of photocatalysis and became more durable and long-lasting in a clean and environmental-friendly way.

Awards Won:

American Chemical Society: Certificate of Honorable Mention