

Publication

Attraction in Action: Reduction of Water to Dihydrogen Using Surface-Functionalized TiO₂ Nanoparticles

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The reactivity of a heterogeneous rhodium(III) and ruthenium(II) complex-functionalized TiO₂ nanoparticle (NP) system is reported. The ruthenium and rhodium metal complexes work in tandem on the TiO₂ NPs surface to generate H₂ through water reduction under simulated and normal sunlight irradiation. The functionalized TiO₂ NPs outperformed previously reported homogeneous systems in turnover number (TON) and frequency (TOF). The influence of individual components within the system, such as pH, additive, and catalyst, were tested. The NP material was characterized using TGA-MS, ¹H NMR spectroscopy, FTIR spectroscopy, solid absorption spectroscopy, and ICP-MS. Gas chromatography was used to determine the reaction kinetics and recyclability of the NP-supported photocatalyst

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