



Well-Separated Photoinduced Charge Carriers on Hydrogen Production Using NiS₂/TiO₂ Nanocomposites

Sivagowri Shanmugaratnam,* Punniamoorthy Ravirajan, Shivatharsiny Yohi,* and Dhayalan Velauthapillai*



Cite This: *ACS Omega* 2024, 9, 1627–1633



Read Online

ACCESS |



Metrics & More



Article Recommendations



Supporting Information

ABSTRACT: Photocatalytic hydrogen production is a sustainable and greenhouse-gas-free method that requires an efficient and abundant photocatalyst, which minimizes energy consumption. Currently, interests in transition metal chalcogenide materials have been utilized in different applications due to their quantum confinement effect and low band gaps. In this study, different wt % of NiS₂-embedded TiO₂ nanocomposites were synthesized by a facile hydrothermal method and utilized for photocatalytic hydrogen production under extended solar irradiation. Among the materials studied, the highest amount (4.185 mmol g⁻¹) of hydrogen production was observed with 15 wt % of the NiS₂/TiO₂ nanocomposite. The highest photocatalytic activity may be due to the well separation of photoinduced charge carriers on the catalyst, which was confirmed by the electrochemical studies. Thus, we believe that these photocatalysts are promising candidates for future applications.

