



## **Effect of parameters on simultaneous H<sub>2</sub> production and biodiesel wastewater remediation by photocatalytic oxidation via TiO<sub>2</sub> (P25)**

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Biodiesel wastewater is produced from the conventional biodiesel process. In Thailand, there are around 350,000 L/day of produced biodiesel, resulting in 70,000 L/day of generated wastewater. This research was carried out to study the effect of parameters on simultaneous H<sub>2</sub> production and biodiesel wastewater remediation by photocatalytic oxidation via TiO<sub>2</sub>. Commercial titanium dioxide (P25) was used because of its good stability, chemically resistant and environmental friendly. The 120 W UV lamp was exploited as a light source. The investigated parameters were catalyst loading (1-10 g/L), dilution time (2-200 times), and phases of TiO<sub>2</sub>. The gas chromatography coupled with thermal conductivity detector (GC-TCD) was employed to measure the amount of produced hydrogen gas. The parameters in wastewater including the biological oxygen demand (BOD), chemical oxygen demand (COD) and oil and grease (O&G) were monitor both before and after treatment process. The preliminary results exhibited that the condition with catalyst loading of 4 g/L and dilution time of 3.3 showed the amount of produced hydrogen gas of 42.6 μmol.h<sup>-1</sup> and the removal of BOD, COD and O&G of 86.21%, 35.91% and 84.78% with the initial concentration in the range of 42000 – 80000, 60815 – 96600 and 120 – 350 ppm, respectively

**Keywords:** Biodiesel wastewater; Photocatalyst; Hydrogen production