

# Photocatalytic Properties of Hydrogenated Titanium Dioxide Thin Films Prepared by Sparking Method

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Titanium dioxide ( $\text{TiO}_2$ ) is a widely used photocatalyst in water splitting process for hydrogen production. In this study, hydrogenation of the titanium dioxide thin films was investigated in order to examine the photocatalytic properties and to improve the performance for photoactivity. Titanium dioxide thin films were prepared by sparking method, then annealed at  $500^\circ\text{C}$  in hydrogen atmosphere to get hydrogenated titanium dioxide thin films ( $\text{H-TiO}_2$ ). The result of scanning electron microscopy and atomic force microscopy showed that the thickness of films was  $2\text{ }\mu\text{m}$ . The film was porous with high specific surface area which promotes good photocatalytic activity. UV-Vis-NIR spectrometer measurement indicated that the sunlight absorbance of  $\text{H-TiO}_2$  was more than the absorbance of  $\text{TiO}_2$ . For these results suggest that  $\text{H-TiO}_2$  has better photocatalytic properties than the  $\text{TiO}_2$ .

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