

Abstract Submitted  
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**Photocatalytic Hydrogen Generation of Surface-modified TiO<sub>2</sub>.<sup>1</sup>**

ZHENNI WU, KEJI SHI, JIAXING LI, CHAO LU, YANLING HE, ALAN MAN CHING NG, Southern University of Science and Technology — Black TiO<sub>2</sub> has gained considerable attention in terms of being a photocatalyst for hydrogen generation, due to its substantially extended solar absorption and abundant defects, which can enhance electron density and improve charge transportation. However, defects can also act as the recombination center of photoinduced carriers, jeopardizing the photocatalytic hydrogen evolution. Here, we have fabricated black TiO<sub>2</sub> by a facile but highly controllable method-atomic layer deposition, through which the thickness and absorption region of black TiO<sub>2</sub> can be carefully designed. Then, we use black TiO<sub>2</sub> to modify the surface of anatase TiO<sub>2</sub> and the material was characterized. The fabricated material has promoted the separation and transportation of photoinduced holes and electrons. Subsequent Au nanoparticles decoration on anatase TiO<sub>2</sub>/black TiO<sub>2</sub> has leveled up the photocatalytic hydrogen generation rate through surface plasmonic effects by increasing more photoinduced holes and electrons and the results were discussed.

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