

## Supporting Information

### Photocatalytic properties of Pd/TiO<sub>2</sub> nanosheets for hydrogen evolution from water splitting

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Table S1. Physical properties of the samples.

Samples	Amount of Pd (At.%)	Average size of Pd NPs <sup>a</sup> (nm)
W0	0	0
W1	0.07	~5.8
W2	0.10	~6.3
W3	0.18	~6.5
W4	0.21	~7.1
W5	0.28	~8.9

a. Average size of Pd NPs was measured by Dynamic Light Scattering (DLS).

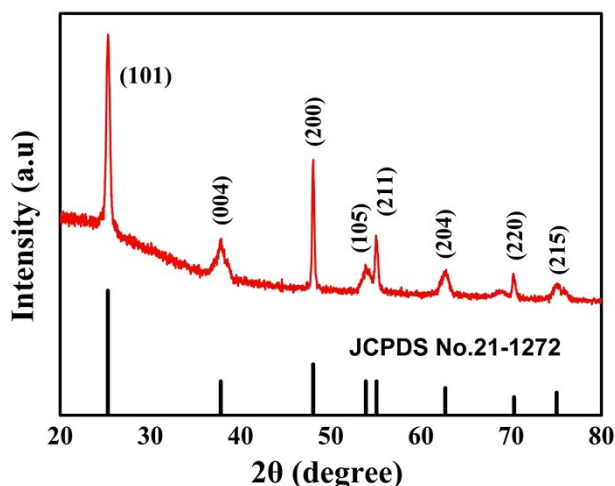
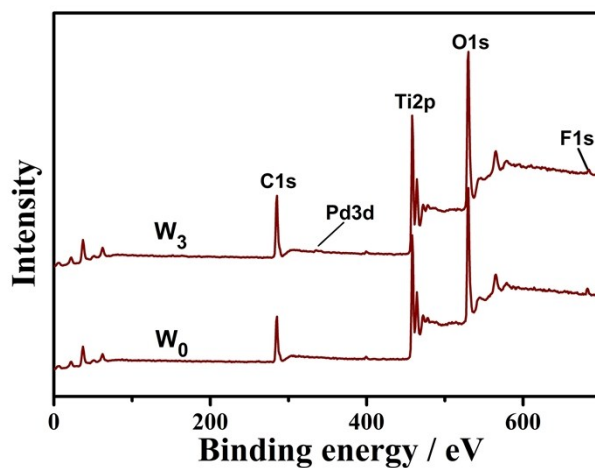
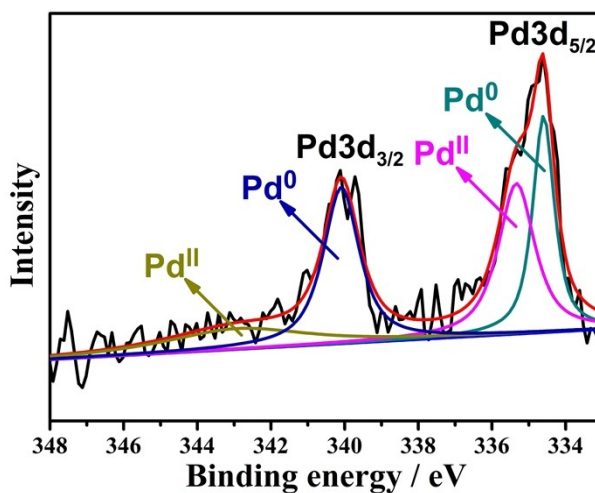


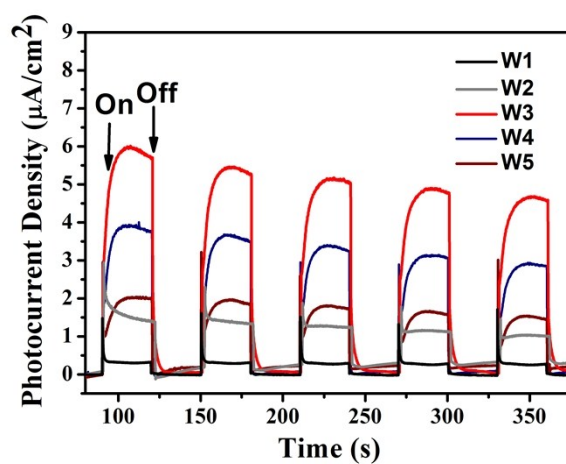
Figure S1. XRD patterns of pure TiO<sub>2</sub> nanosheets.



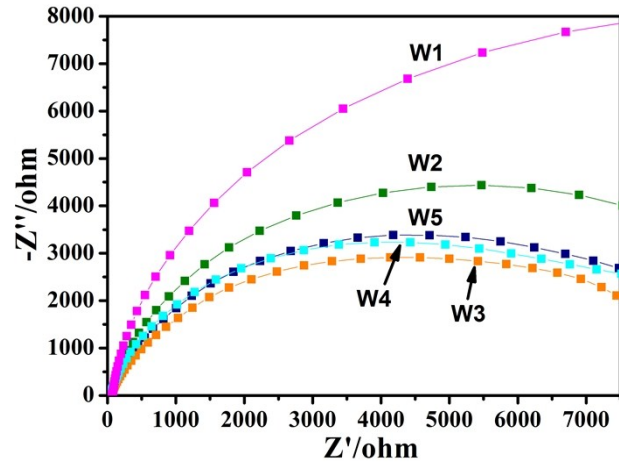
**Figure S2.** XPS spectra of the Pd/TiO<sub>2</sub> nanosheets (0.18 At.%, W3)



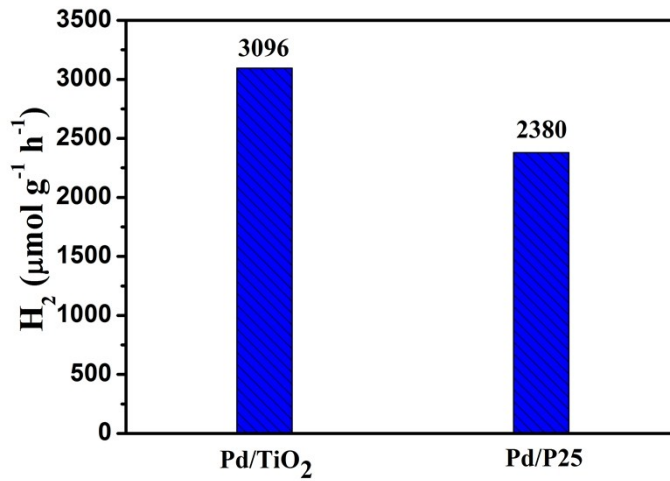
**Figure S3.** The high-resolution XPS spectra of Pd 3d for W3.



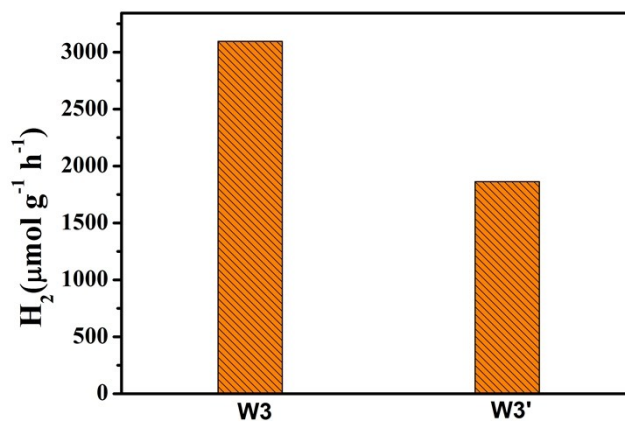
**Figure S4.** The on-off photocurrent for W1, W2, W3, W4 and W5 as photoanodes, in 0.1 M KCl solution, respectively.



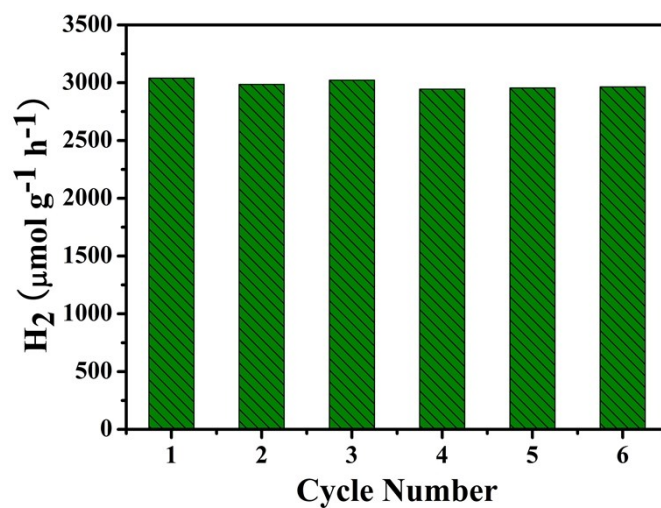
**Figure S5.** Nyquist plot of the electrodes based on W1, W2, W3, W4 and W5 in the dark.



**Figure S6.** A comparison of photoactivity of Pd/TiO<sub>2</sub> nanosheets and Pd/P25.



**Figure S7.** Comparison of  $H_2$  evolution rate for W3 and W3' (Pd NPs on fluorine-free TiO<sub>2</sub> nanosheets).



**Figure S8.** Photocatalytic stability of Pd/TiO<sub>2</sub> nanosheets for H<sub>2</sub> evolution from water splitting under irradiation from 300 W Xe lamp.