

Supporting Information

# **Remarkably Improved Photocatalytic Hydrogen Evolution Performance of Crystalline TiO<sub>2</sub> Nanobelts Hydrogenated at Atmospheric Pressure with the Assistance of Hydrogen Spillover**

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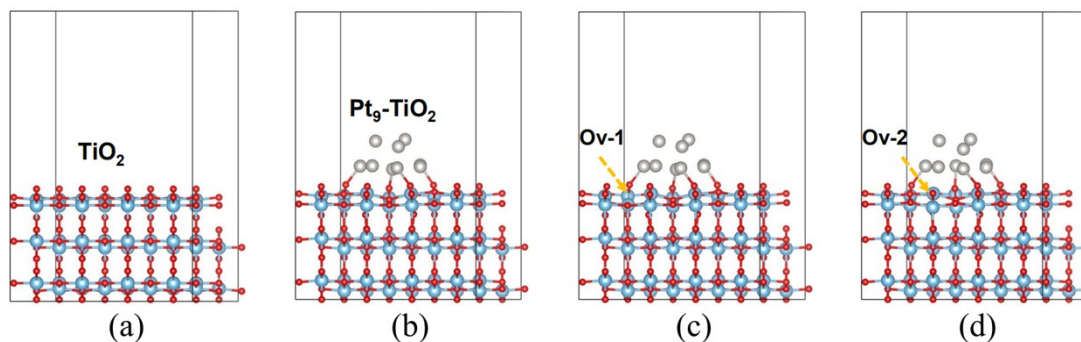
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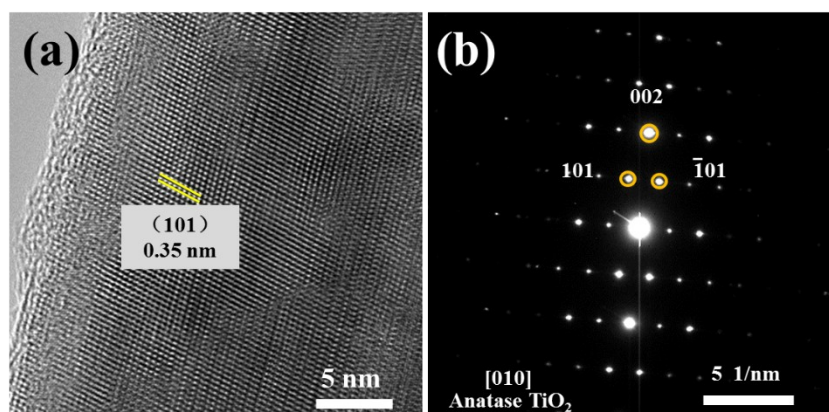
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**Table S1.** the relative concentration of surface Ti-OH and Ti-O-Ti.

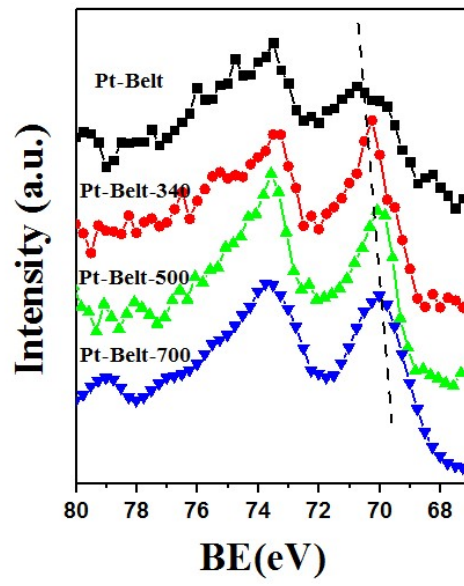
	Pt-Belt	Pt-Belt-340	Pt-Belt-500	Pt-Belt-700
Ti-OH	34.9%	23.9%	29.1%	27.0%
Ti-O-Ti	65.1%	76.1%	70.9%	73.0%
Ti-OH/ Ti-O-Ti	0.54	0.31	0.41	0.37



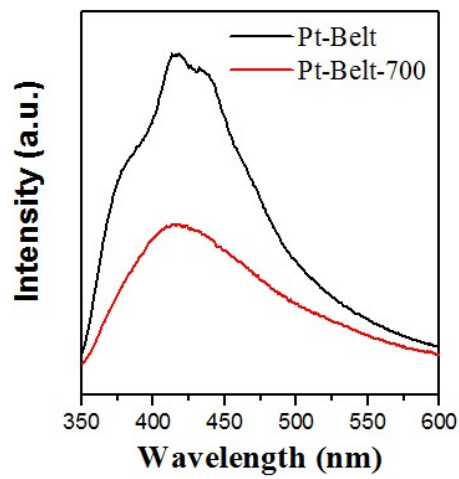
**Fig. S1** Optimized configurations of (a) pristine  $\text{TiO}_2$ ; (b) Pt cluster (9 atoms) loaded  $\text{TiO}_2$ ; (c) and (d) oxygen vacancy containing  $\text{Pt}_9\text{-TiO}_2$ , denoted as Ov-1 and Ov-2. The blue, red and gray balls represent Ti, O and Pt atoms respectively. Oxygen vacancy was marked with yellow arrow.



**Fig. S2** The HRTEM image and SAED patterns of pristine  $\text{TiO}_2$  belt.



**Fig. S3** Pt *4f* XPS spectra of Pt-Belt and Pt-Belt-x.



**Fig. S4** Photoluminescence spectra of Pt-belt and Pt-belt-700.