

## SUPPORTING INFORMATION

# Room temperature synthesis of reduced TiO<sub>2</sub> and its application as support for catalytic hydrogenation

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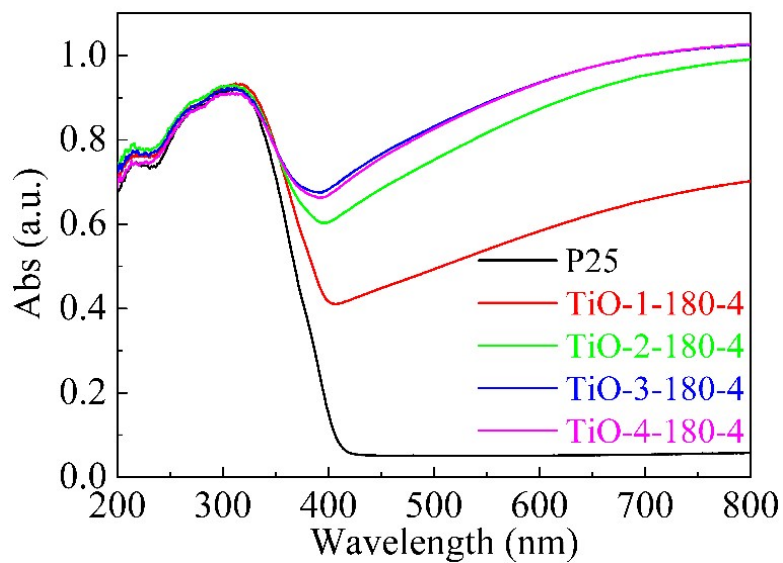
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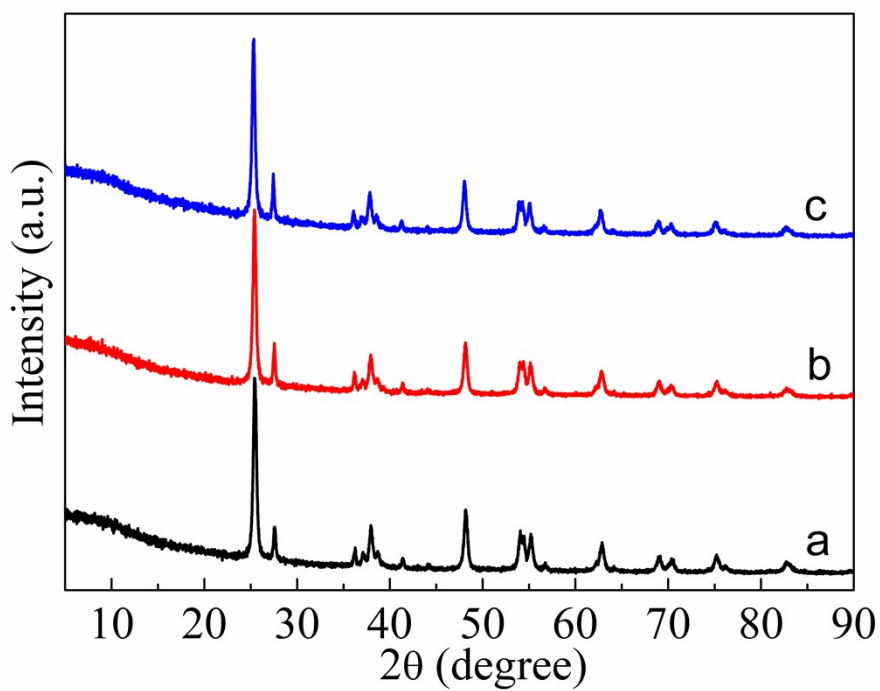
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# These authors contributed equally to this study.

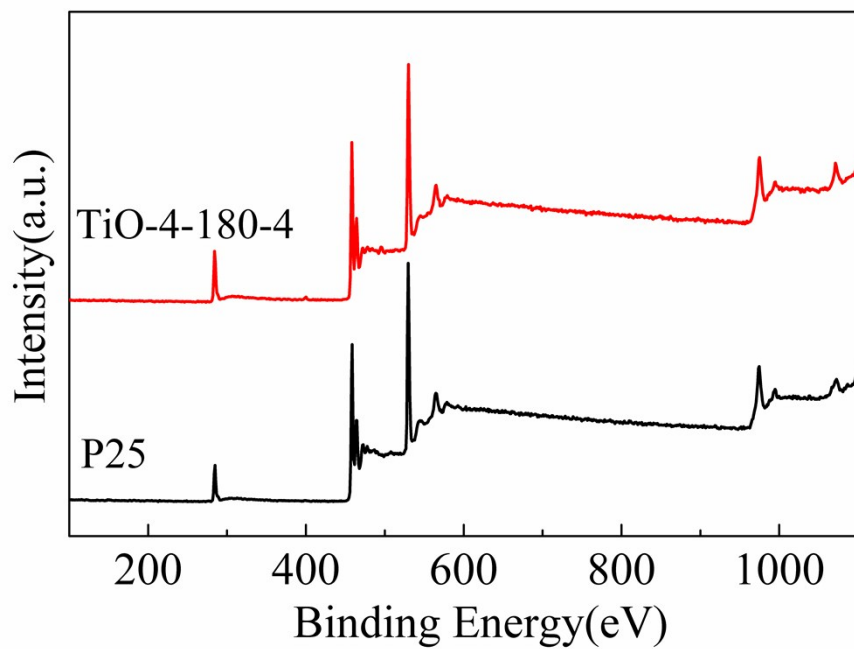
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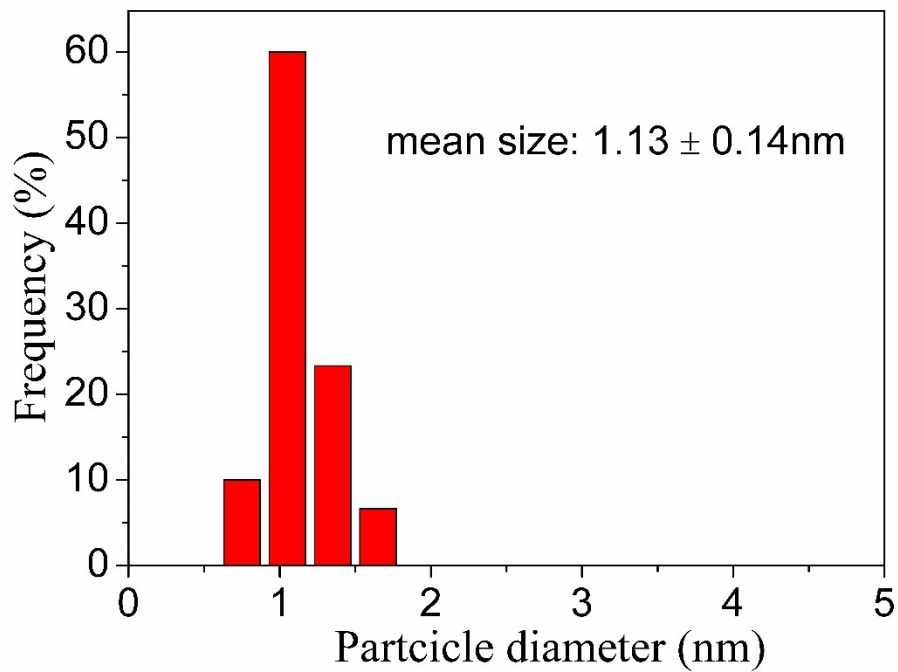
**Figure S1.** The UV-Vis diffuse reflectance spectra of P25 nanocrystals, TiO-1-180-4, TiO-2-180-4, TiO-3-180-4 and TiO-4-180-4.



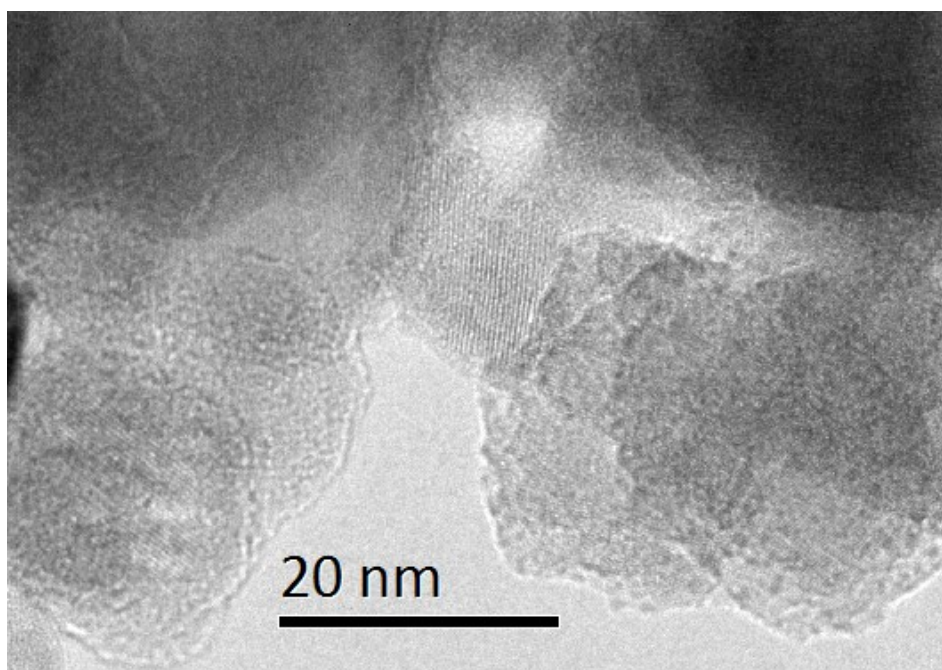
**Figure S2.** XRD patterns of P25 nanocrystals and  $\text{TiO}_{2-x}$ , (a) P25 nanocrystals; (b) TiO-1-80-0.5; (c) TiO-1-80-1.



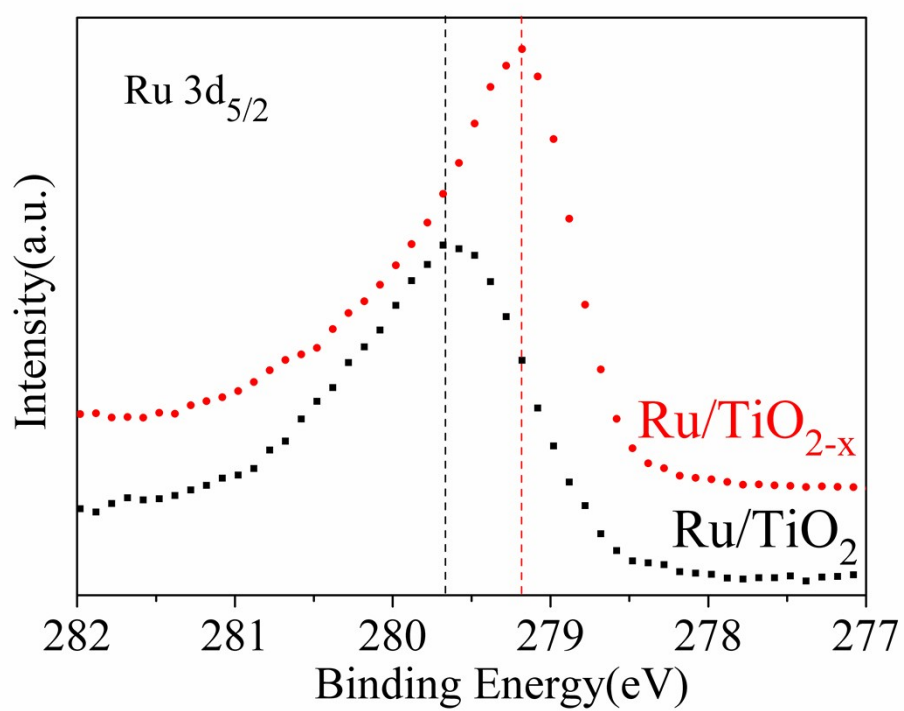
**Figure S3.** Full XPS surveys of P25 nanocrystals and TiO-4-180-4.



**Figure S4.** The particle size distribution of Ru in 5 wt% Ru/TiO<sub>2</sub>.



**Figure S5.** TEM image of 5 wt% Ru/TiO<sub>2-x</sub>.



**Figure S6.** Ru 3d<sub>5/2</sub> XPS of Ru/TiO<sub>2</sub> and Ru/TiO<sub>2-x</sub> with Ar<sup>+</sup> etching.

**Table S1.** Activation energies, pre-exponential factors (A) and initial rates (at 100°C) of hydrogenation N-methylpyrrole by using 5% Ru/TiO<sub>2</sub> and 5% Ru/TiO<sub>2-x</sub>.

	5% Ru/TiO <sub>2</sub>	5% Ru/TiO <sub>2-x</sub>
<i>E<sub>a</sub></i> (kJ mol <sup>-1</sup> )	50.9	50.0
<i>A</i> (10 <sup>7</sup> h <sup>-1</sup> )	5.41	7.31
<i>r</i> (mol/(L*h))	0.51	0.93