SUPPORTING INFORMATION

Room temperature synthesis of reduced TiO$_2$ and its application as support for catalytic hydrogenation

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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 TiO$_{2x}$, (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/TiO₂.
Figure S5. TEM image of 5 wt% Ru/TiO$_{2-x}$.

Figure S6. Ru 3d$_{5/2}$ XPS of Ru/TiO$_2$ and Ru/TiO$_{2-x}$ with Ar$^+$ etching.
**Table S1.** Activation energies, pre-exponential factors (A) and initial rates (at 100°C) of hydrogenation N-methylpyrrole by using 5% Ru/TiO$_2$ and 5% Ru/TiO$_{2-x}$.

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<thead>
<tr>
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<th>5% Ru/TiO$_2$</th>
<th>5% Ru/TiO$_{2-x}$</th>
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<tbody>
<tr>
<td>$E_a$ (kJ mol$^{-1}$)</td>
<td>50.9</td>
<td>50.0</td>
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<tr>
<td>$A$ ($10^7$ h$^{-1}$)</td>
<td>5.41</td>
<td>7.31</td>
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<tr>
<td>$r$ (mol/(L*h))</td>
<td>0.51</td>
<td>0.93</td>
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