Harvesting broadband absorption of solar spectrum for enhanced photocatalytic H₂ generation

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SUPPORTING INFORMATION
Figure S1 Schematic diagram showing the energy band positions of TiO$_2$, CuO with respect to standard hydrogen electrode (SHE) at pH 1, and transfer of electron from the conduction band of TiO$_2$ to CuO. The $E_{cb}$ of TiO$_2$ (anatase) is -0.25 V vs SHE$^1$, and the $E_{cb}$ of CuO is 0.96 V vs SHE$^2$. 

\[ E_{g} = 3.2 \text{ eV} \]

\[ E_{g} = 1.7 \text{ eV} \]
Figure S2 Nitrogen adsorption/desorption isotherms of (a) NP, (b) 3% CuO-NP, (c) NT and (d) 3% CuO-NT with (insets) corresponding BJH pore size distribution.
<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>H$_2$ evolution rate (mmol/gh)</th>
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<tbody>
<tr>
<td></td>
<td>NP</td>
</tr>
<tr>
<td>25.0</td>
<td>0.0750</td>
</tr>
<tr>
<td>50.0</td>
<td>0.277</td>
</tr>
<tr>
<td>75.0</td>
<td>0.858</td>
</tr>
<tr>
<td>90.0</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Table S1 H$_2$ evolution rate for different photocatalysts at different temperatures.
Figure S3 Temperature measurement of NT and CuO-NT in 20% vol glycerol solution under Xe Lamp illumination at 1000W/m².
Figure S4 Initial rates of H$_2$ evolution for cyclic stability test of (a) NP and 3%CuO-NP; (b) NT and 3%CuO-NT at 90°C
Figure S5 (a) Amount of H₂ evolved for cyclic stability test under Xe irradiation, measured for 4 cycles. (b) Initial rates of H₂ evolution for cyclic stability test of 3%CuO-NP and 3%CuO-NT
References
