Supplementary Information for:

A coordination chemistry approach for shape controlled synthesis of indium oxide nanostructures and its photoelectrochemical properties

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**Fig. S1** Low magnification SEM images of the indium hydroxide cubes (a), maize corns (b) and indium sulfate hydroxide hydrate crystals (c).
Fig. S2. Low magnification SEM images of indium oxides cubes and particles.

Fig. S3. Current-Voltage characteristics of indium oxide cubes, maize corns and particle films on FTO substrates measured in a three electrode electrochemical cell using Pt plate as counter and Ag/AgCl(3M NaCl) as reference electrode. The electrolyte was 1M NaOH solution. The measurements were carried by irradiating the sample with simulated 1 Sun illumination.

Table S1 shows the conduction and valence band positions of indium oxide cubes, maize corns and particles calculated from the absolute electronegativity values using the following equations.
\[ E_{CB} = X - 0.5E_g + E_e \]
\[ E_{VB} = E_{VB} + E_g \]

Where, \( E_{VB} \) is valence band position, \( E_{CB} \) is the conduction band position, \( X \) is the absolute electronegativity of the semiconductor, which is defined as the geometric mean of the absolute electronegativity of the constituent atoms, \( E_e \) is the energy of free electrons on the hydrogen scale (ca. 4.5 eV), \( E_g \) is the band-gap of the semiconductor.

It is clear that all the three samples with different morphologies have different electronic structures with valence and conduction band levels are located at different energies. Thus a simple chemical strategy can be used to tune band-edge positions of indium oxide electrodes.

References:

<table>
<thead>
<tr>
<th>Samples</th>
<th>Electronegativity (eV)</th>
<th>Estimated band-gap from UV-Vis spectra (eV)</th>
<th>Valence band Level (eV) vs vacuum</th>
<th>Conduction band Level (eV) vs vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubes</td>
<td>5.26</td>
<td>2.84</td>
<td>6.68</td>
<td>3.84</td>
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<tr>
<td>Maize corns</td>
<td>5.26</td>
<td>2.97</td>
<td>6.74</td>
<td>3.77</td>
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<tr>
<td>Particles</td>
<td>5.26</td>
<td>3.29</td>
<td>6.90</td>
<td>3.61</td>
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