Enhanced hydrogen production under visible light source and dye degradation under natural sunlight using nanostructured doped zinc orthotitanates

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Supporting Information

S1 JCPDS Data

**Fig 1** JCPDS data of $\text{Zn}_2\text{TiO}_4$ (cubic) [86-0154]

**Fig 2** JCPDS data of $\text{Zn}_2\text{TiO}_4$ (Tetragonal) [86-0158]
Fig 3 JCPDS data of Ag [04-0783]

S-2 FTIR analysis

Fig: FTIR spectra of Zn$_2$TiO$_4$, Ag@Zn$_2$TiO$_4$ and Co@Zn$_2$TiO$_4$ A) in the range 4000-350 cm$^{-1}$  B) magnified in the range 1000-350 cm$^{-1}$
S-3: Elemental analyses

The elemental analysis of the synthesized compounds has been performed by Energy Dispersive X ray Fluorescence (EDXRF) analyses technique. The data given in table 1 shows that % Zn and Ti observed in all synthesized samples is in good agreement with expected values and molecular formula of the oxides.

Table: EDXRF data for elemental analyses of zinc orthotitanates

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Compound</th>
<th>Elements (%)</th>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>Zn₂TiO₄</td>
<td>Zn 73.2 (73.2)</td>
<td>Ti 26.8 (26.8)</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Zn₁.₈Co₀.₂TiO₄</td>
<td>Zn 71.4 (69.8)</td>
<td>Ti 25.4 (26.9)</td>
<td>Co 3.3 (3.3)</td>
</tr>
<tr>
<td>03</td>
<td>Zn₁.₈Ag₀.₂TiO₄</td>
<td>Zn 64.3 (64.1)</td>
<td>Ti 24.9 (24.7)</td>
<td>Ag 10.8 (11.2)</td>
</tr>
</tbody>
</table>

Fig. ED pattern of Ag@Zn₂TiO₄
S-5: Pore volume plots

Fig. 1 Pore volume plot of Zn\textsubscript{2}TiO\textsubscript{4}

Fig. 2 Pore volume plot of Ag@Zn\textsubscript{2}TiO\textsubscript{4}
Fig. 3 Pore volume plot of Co@Zn$_2$TiO$_4$
Fig. Effect of amount of Ag@Zn₂TiO₄ on the rate of degradation of AO-8 a) 30 b)20 and c) 10 mg

Fig. 1 Effect of concentration of catalyst for 10 and 20 mg Ag@Zn₂TiO₄ for 5 ppm solution

Fig. 2 Effect of amount of Ag@Zn₂TiO₄ (20 and 30 mg) catalyst for 7.5 ppm Rh-B solution.