

# Supporting Information

## **A Heterojunction Design of Single Layer Hole Tunneling ZnO Passivation Wrapping around TiO<sub>2</sub> Nanowires for Superior Photocatalytic Performance**

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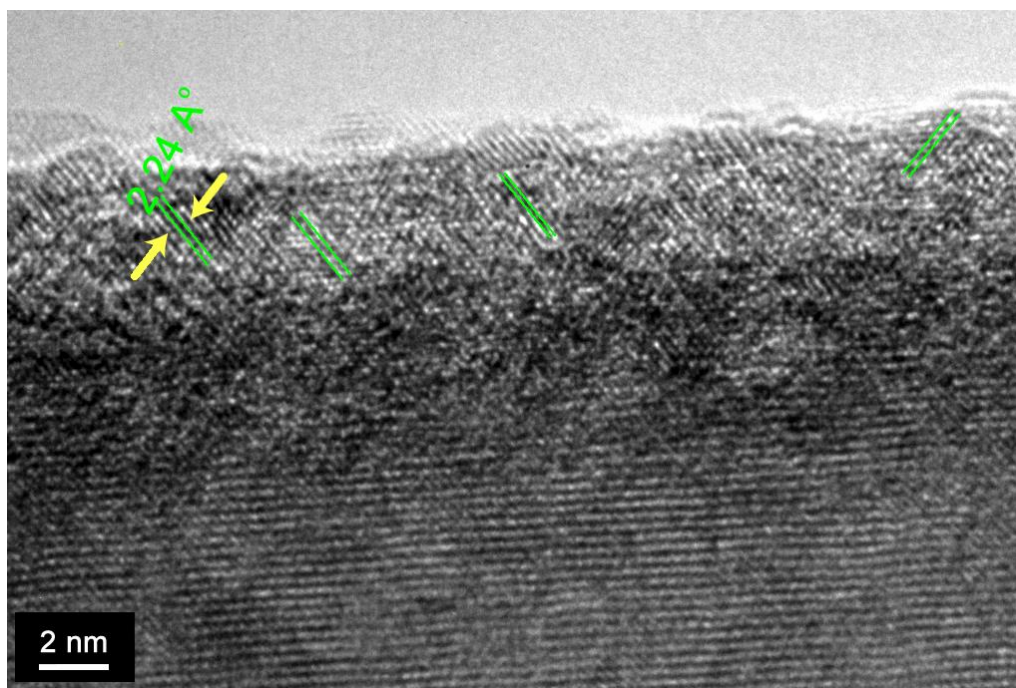


Figure S1. XPS spectra of (a) Ti2p and (b) Zn2p for the bare and coated heterostructures.

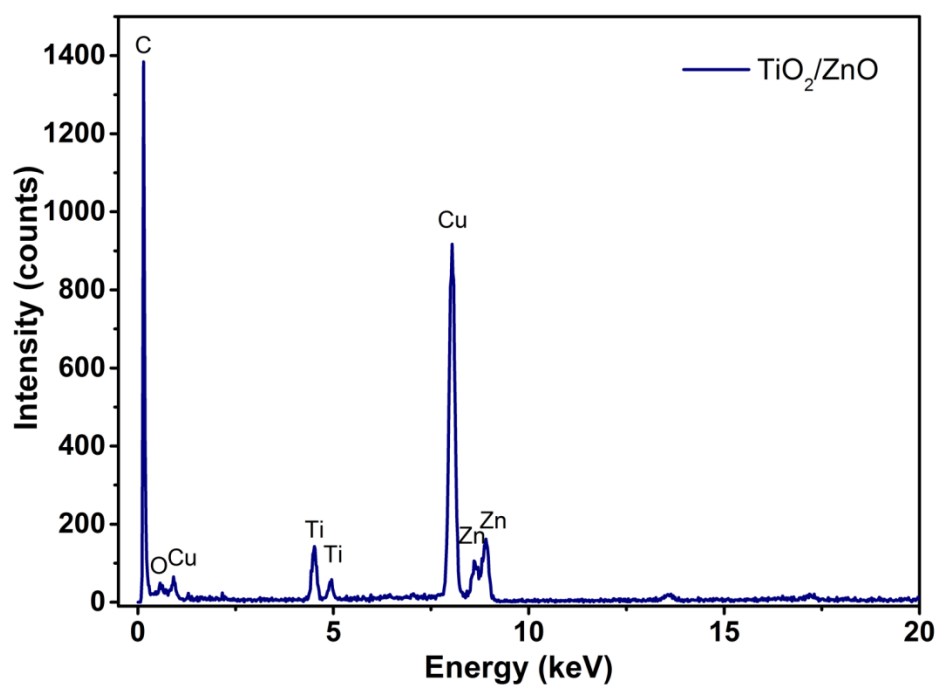
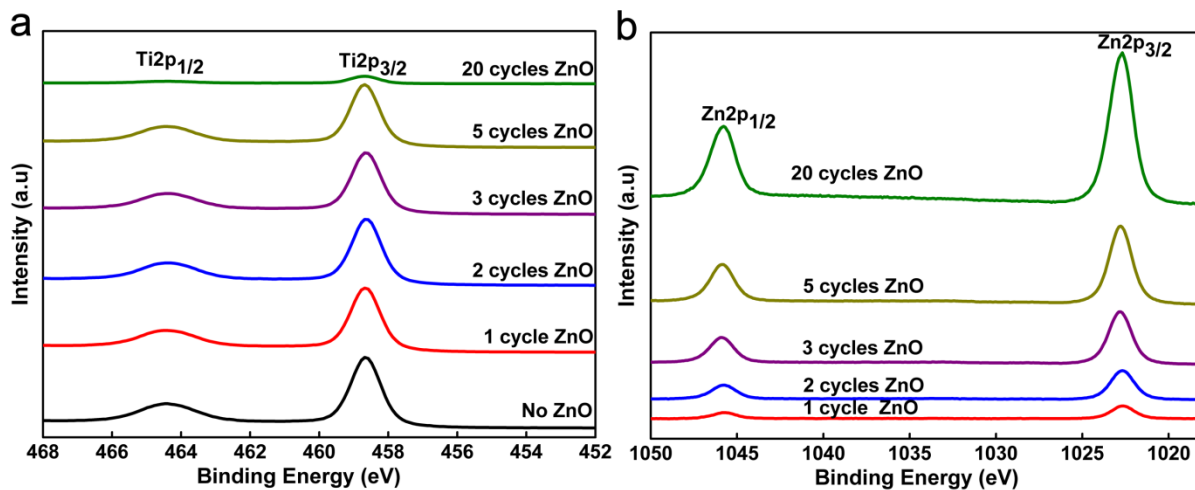
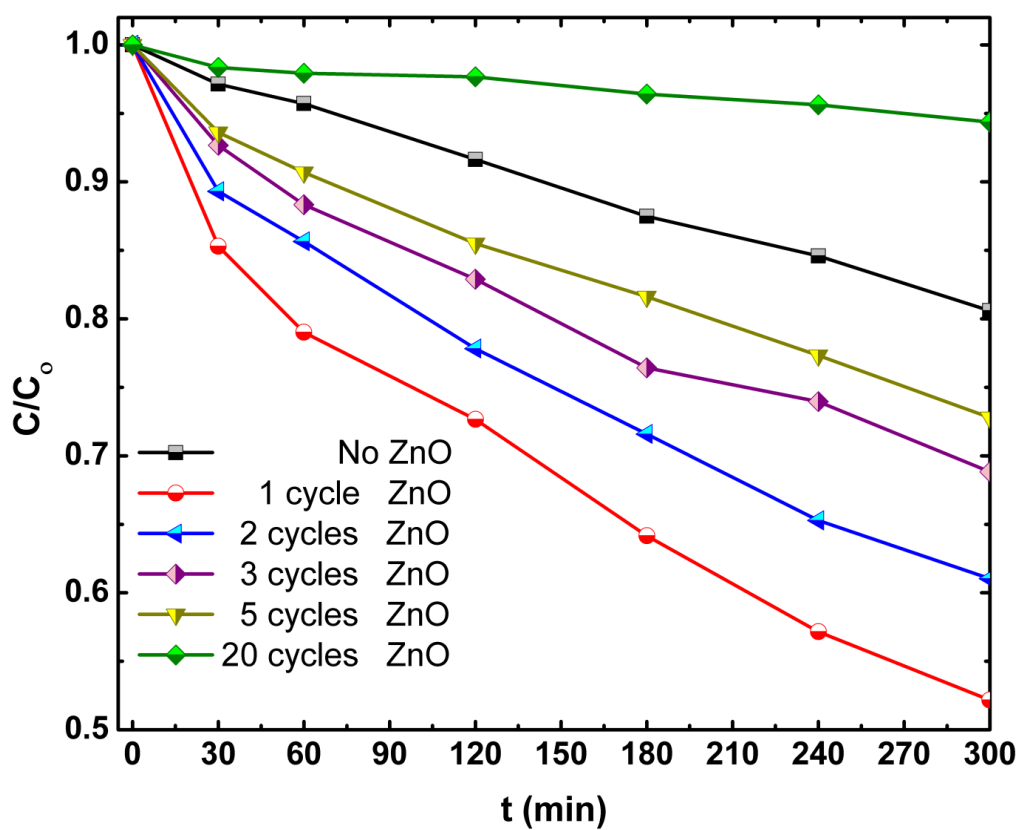


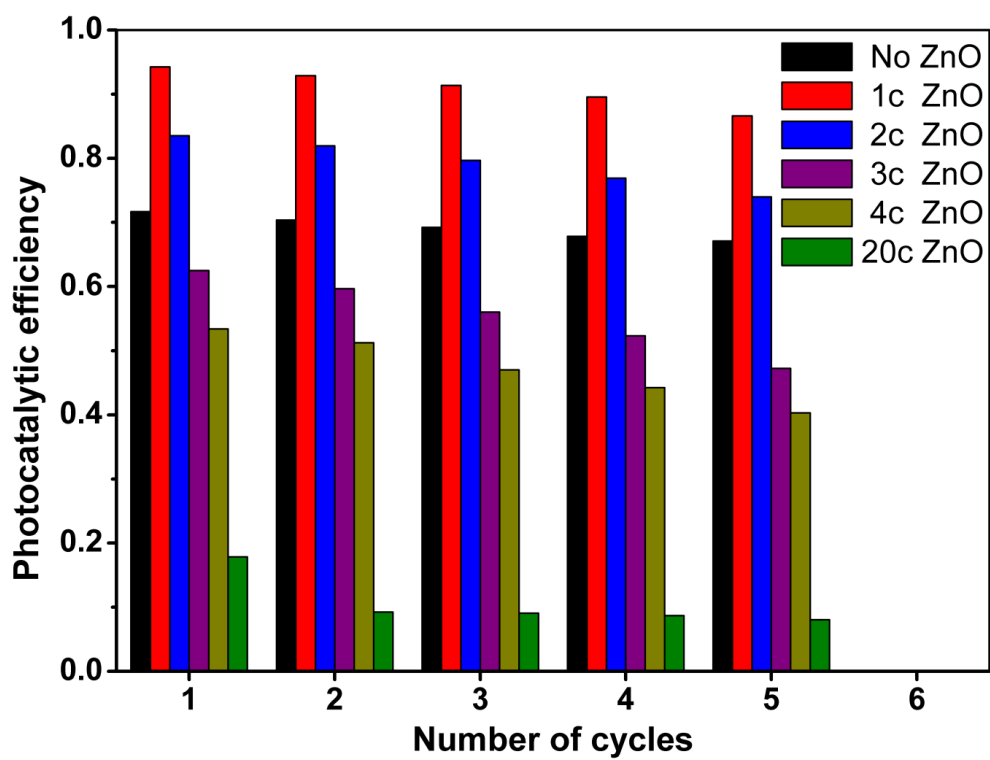
Figure S2. TEM EDS spectrum of the TiO<sub>2</sub>-ZnO sample. Copper is from the form TEM grid.



**Figure S3.** XPS spectra of (a) Ti2p and (b) Zn2p for the bare and coated heterostructures.



**Figure S4.** PCA of MB aqueous solution in the presence of different ZnO cycles and no catalyst cases ( $c_0=68.4 \mu\text{M}$ ) as a function of the irradiation time.



**Figure S5.** Recyclability test for bare and ZnO coated samples.