

## Supporting Information

### **Designed synthesis of anatase-TiO<sub>2</sub> (B) biphase nanowires/ZnO nanoparticles heterojunction for enhanced photocatalysis**

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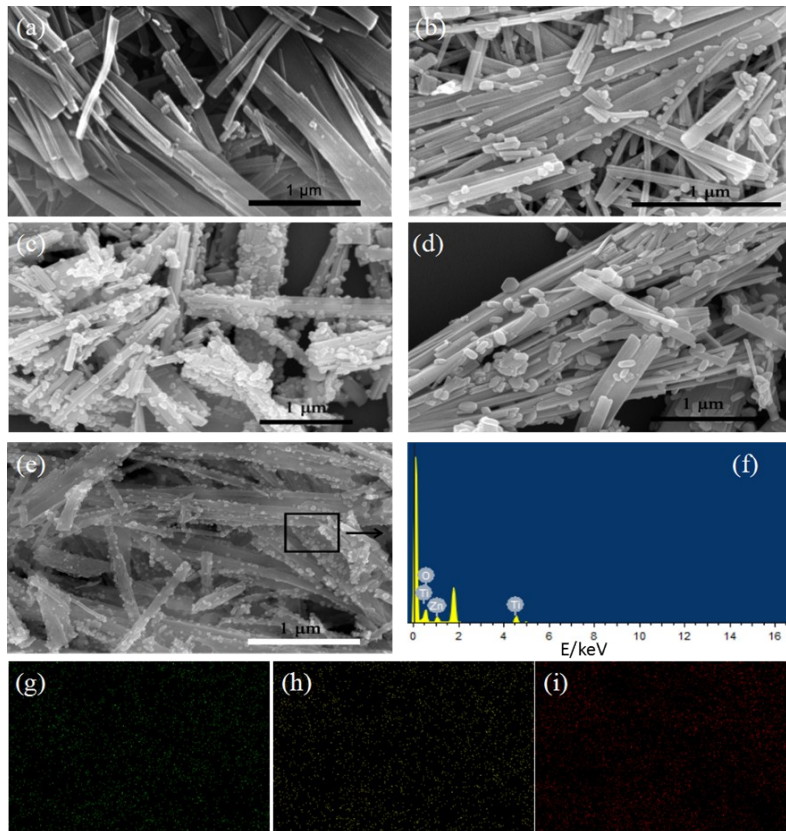


Figure S1. FESEM images of (a) TiO<sub>2</sub> NWs, (b) TiO<sub>2</sub>-ZnO-10, (c) TiO<sub>2</sub>-ZnO-30, (d) TiO<sub>2</sub>-ZnO-50, (e) TiO<sub>2</sub>-ZnO-20, and (f) the corresponding EDS spectrum of (e); EDS maps of (g) Ti element, (h) Zn element, (i) O element.

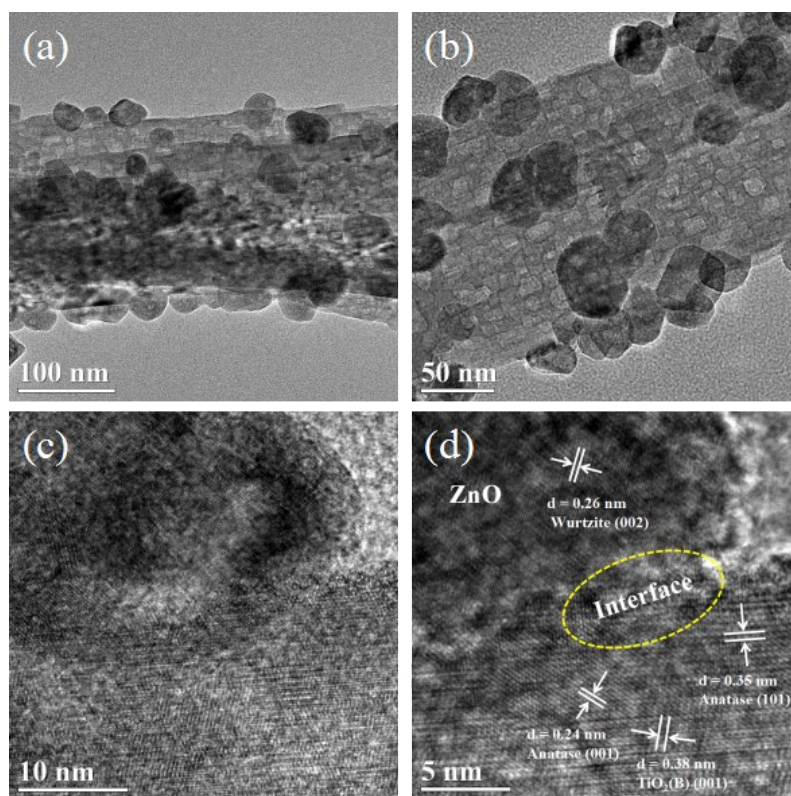


Figure S2. TEM and HRTEM images of the TiO<sub>2</sub>-ZnO-20: low magnification image TEM (a-b) and high magnification TEM image (c-d) images of the TiO<sub>2</sub>-ZnO-20.

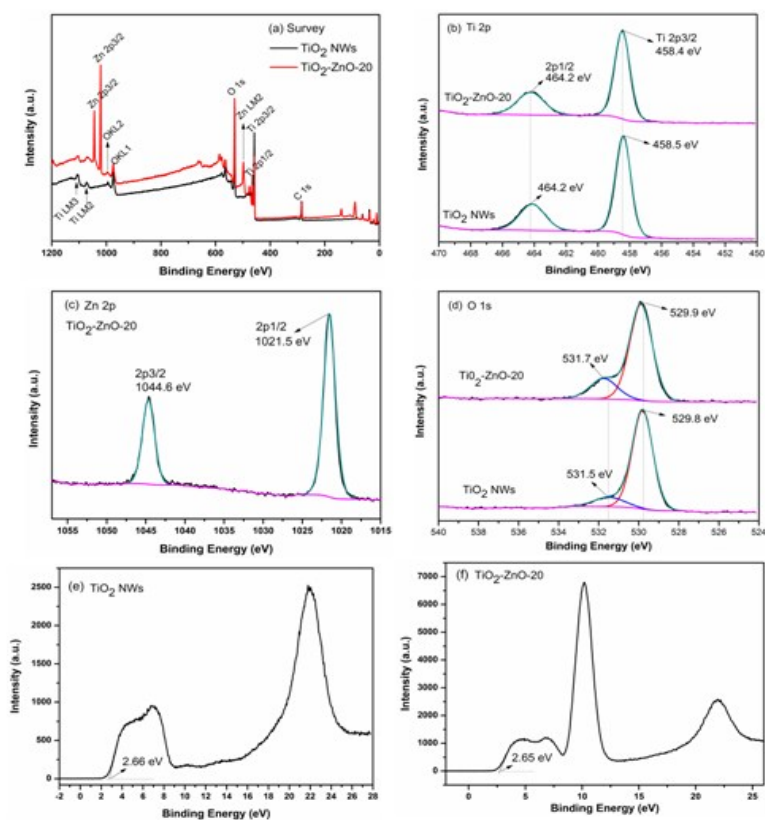


Figure S3. XPS spectra of TiO<sub>2</sub>-ZnO samples. (a) Survey of the samples; (b) Ti 2p; (c) Zn 2p; (d) O 1s; (e) VB XPS spectra of TiO<sub>2</sub> NWs; (f) VB XPS spectra of TiO<sub>2</sub>-ZnO-20.

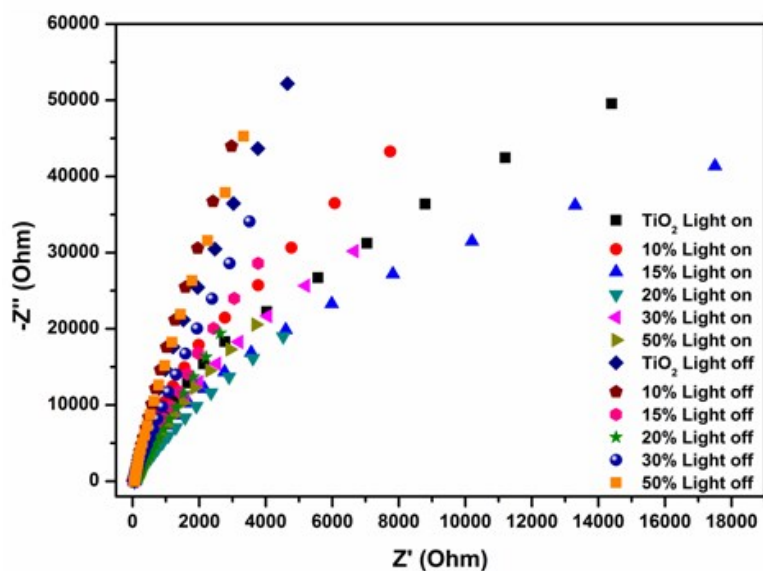


Figure S4. EIS spectra of TiO<sub>2</sub> NWs and TiO<sub>2</sub>-ZnO samples.

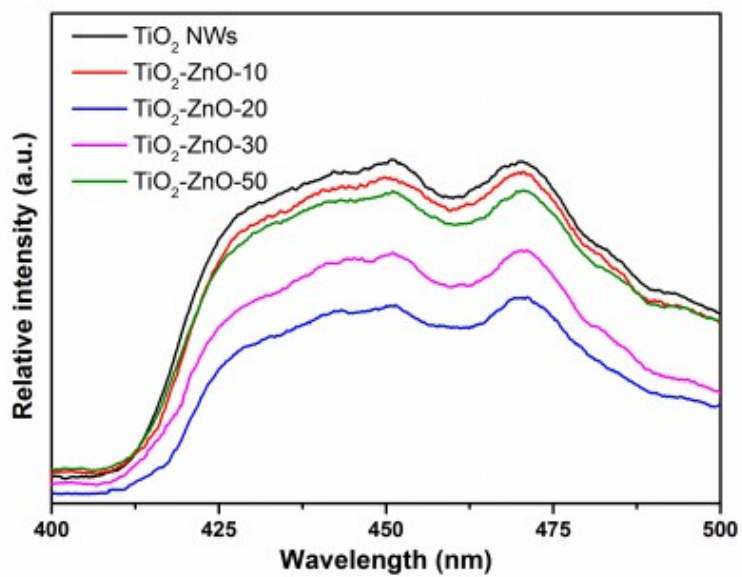


Figure S5. Photoluminescence spectra of TiO<sub>2</sub> NWs and TiO<sub>2</sub>-ZnO samples.

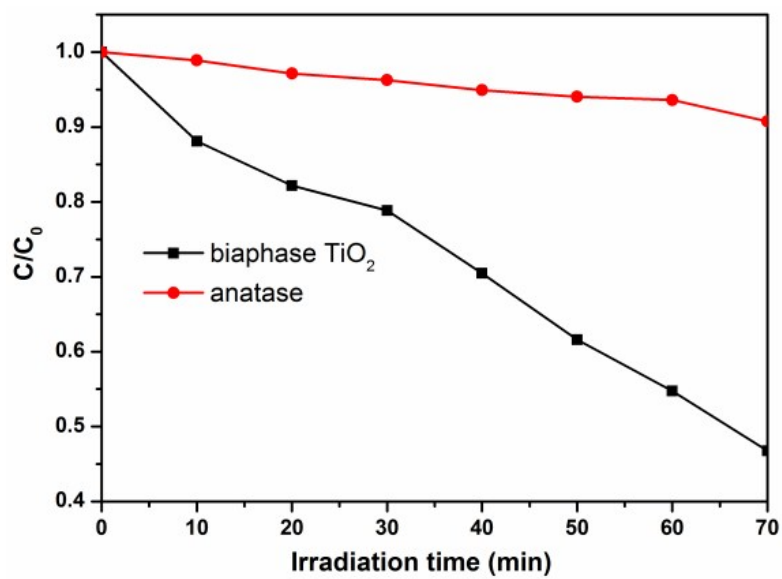


Figure S6. Photocatalytic degradation of MO in the presence of biphasic TiO<sub>2</sub> NWs and single anatase phase.

Table S1. The BET surface area, pore volume, and average pore diameter of TiO<sub>2</sub> NWs and TiO<sub>2</sub>-ZnO samples.

Samples	BET specific surface area (m <sup>2</sup> g <sup>-1</sup> )	Pore volume (cm <sup>3</sup> g <sup>-1</sup> )	Average pore diameter (nm)
TiO <sub>2</sub> NWs	21.94	0.094	17.08
TiO <sub>2</sub> -ZnO-20	23.29	0.078	13.47
TiO <sub>2</sub> -ZnO-50	22.16	0.079	14.28

Table S2. Reaction rate constants of TiO<sub>2</sub> NWs, ZnO NPs, and TiO<sub>2</sub>-ZnO samples.

Sample	TiO <sub>2</sub> NWs	ZnO NPs	TiO <sub>2</sub> -ZnO-10	TiO <sub>2</sub> -ZnO-15	TiO <sub>2</sub> -ZnO-20	TiO <sub>2</sub> -ZnO-30	TiO <sub>2</sub> -ZnO-50
k (min <sup>-1</sup> )	0.0099	0.0202	0.0079	0.0352	0.0420	0.0116	0.0091

Table S3. Weight ratio of ZnO in the TiO<sub>2</sub>-ZnO samples calculated from ICP-MS.

Sample	TiO <sub>2</sub> -ZnO-10	TiO <sub>2</sub> -ZnO-15	TiO <sub>2</sub> -ZnO-20	TiO <sub>2</sub> -ZnO-30	TiO <sub>2</sub> -ZnO-50
ZnO ratio	8.38%	11.15%	15.12%	20.35%	24.28%