

## Electronic Supporting Information

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### **Design of New Magnetic-Photocatalyst Nanocomposites (CoFe<sub>2</sub>O<sub>4</sub>-TiO<sub>2</sub>) as Smart Nanomaterials for Recyclable-Photocatalysis Application**

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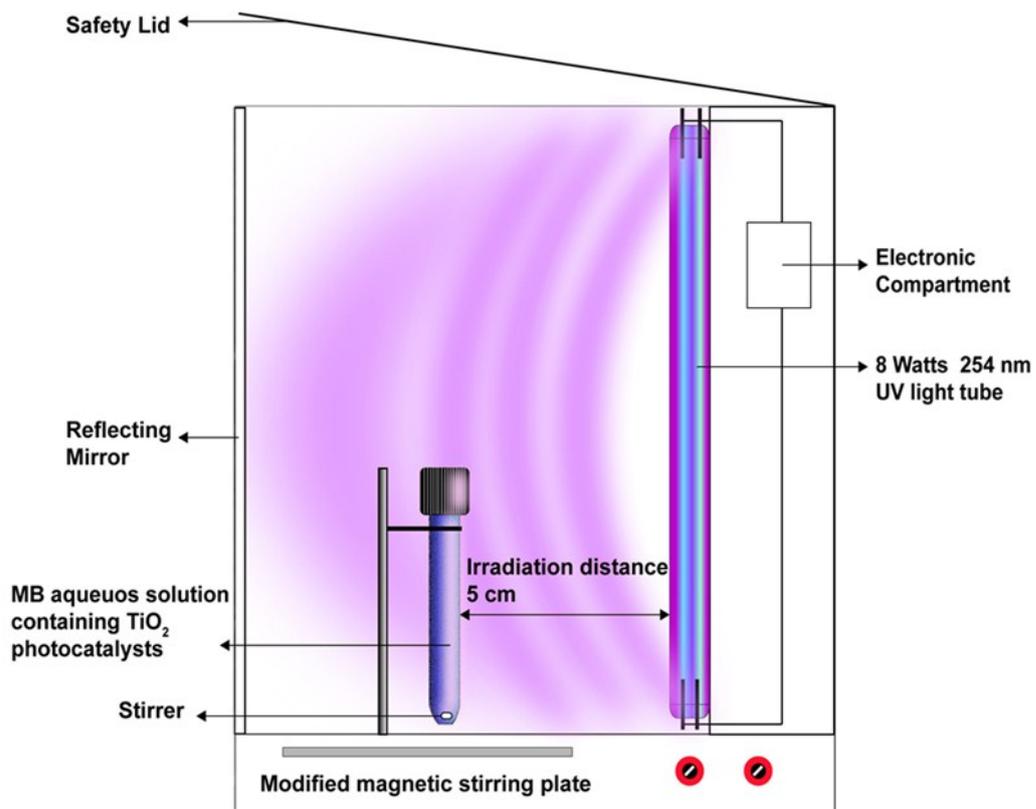
\*Corresponding author:

Wee Siong Chiu

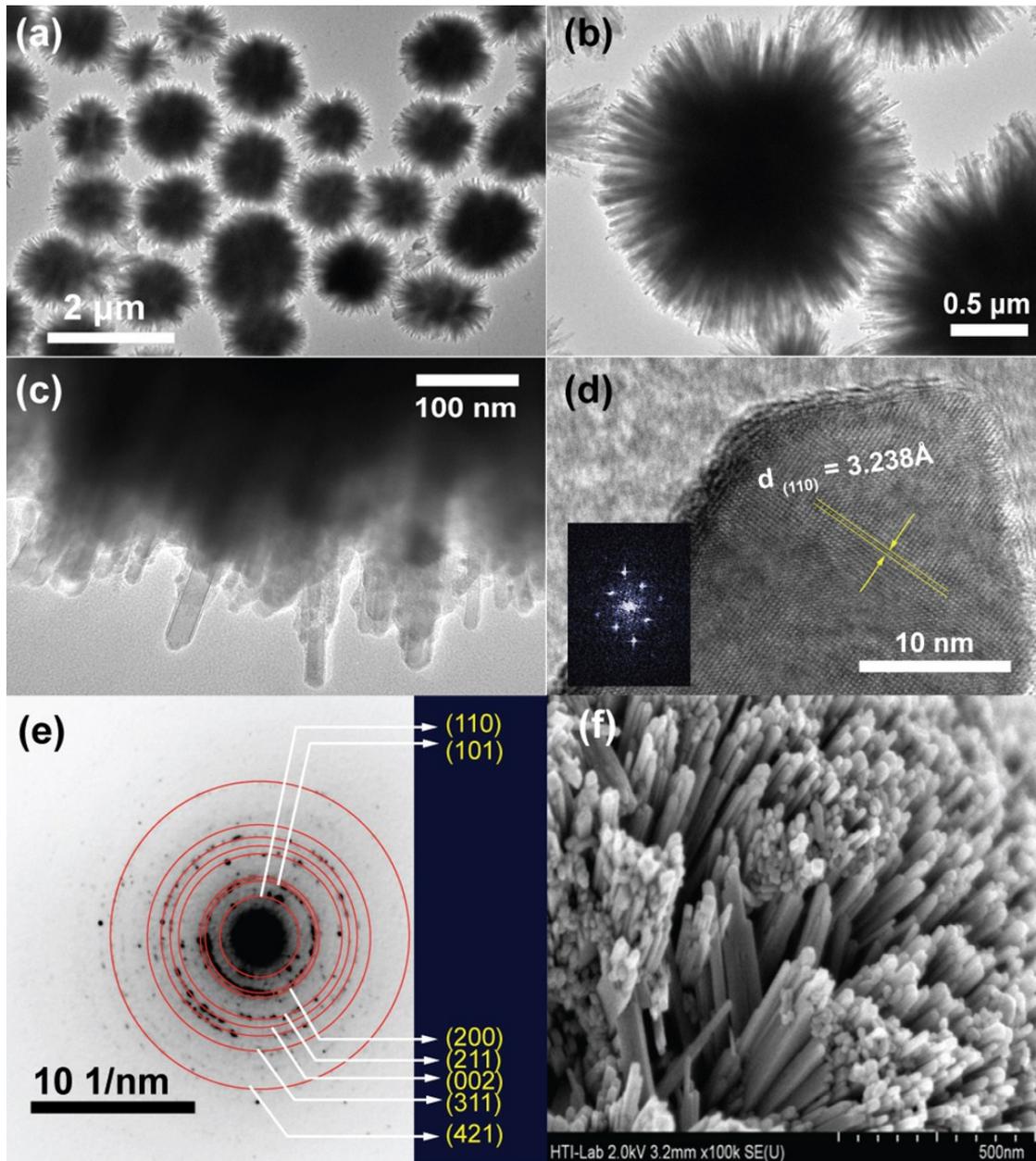
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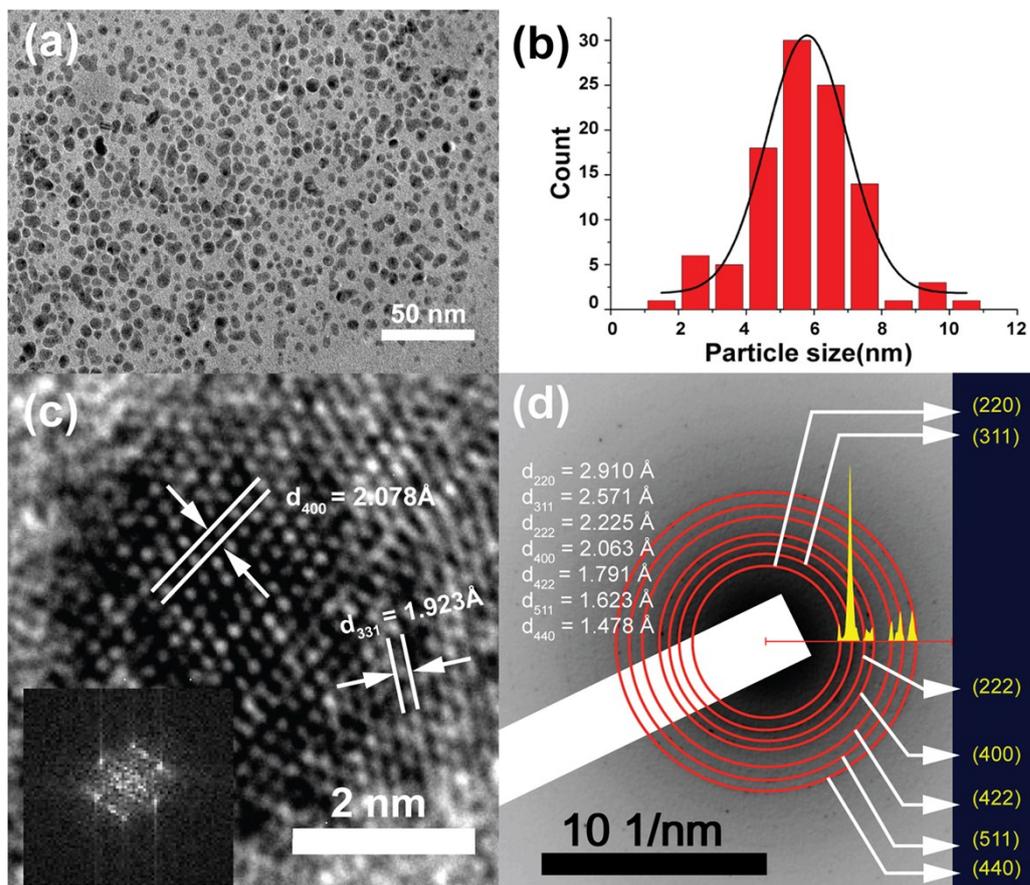
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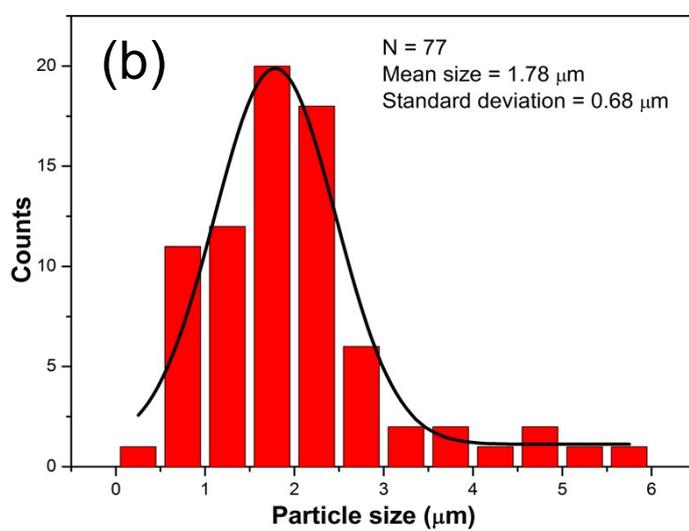
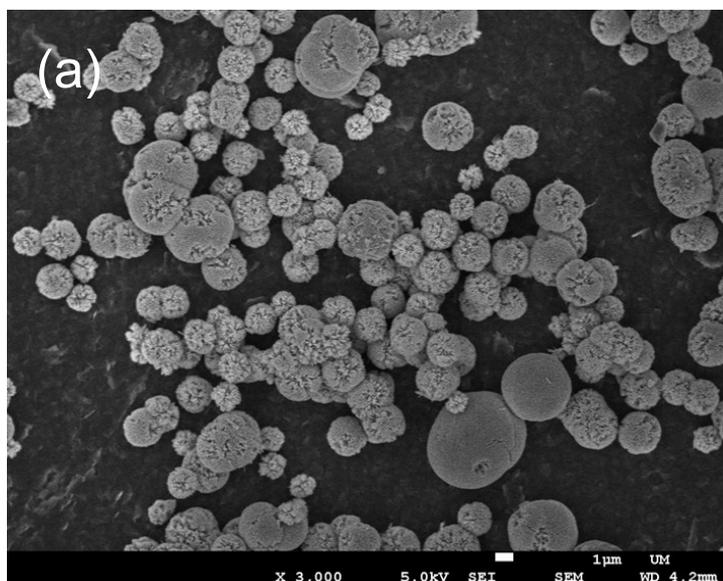
**Fig. S1** Schematic illustration of the photocatalytic reactor system



**Figure S2** TEM images of (a) 3D urchin-like  $\text{TiO}_2$  microspheres, (b) and (c) magnified section of a rear view of a selected  $\text{TiO}_2$  particle, (d) HRTEM image of the  $\text{TiO}_2$  microsphere with lattice spacing of 3.238 Å corresponds to (110) plane of rutile  $\text{TiO}_2$  and inset depicts the FFT generated from Fig. S2d, (e) indexed selected area electron diffraction (SAED) pattern of the red box region indicated in Fig. S2a and the corresponding intensity profile, (f) FESEM images of 3D  $\text{TiO}_2$  microspheres under x100k magnification.



**Figure S3** (a) Low magnification view of CoFe<sub>2</sub>O<sub>4</sub> nanoparticles, (b) nanoparticle size distribution of  $5.79 \pm 1.19 \text{ nm}$  and with polydispersity of 20.56%, (c) high resolution TEM of the selected micrograph shown in (a) and inset depicts the corresponding FFT, (d) indexed SAED pattern and intensity profile of the selected micrograph region shown in (a)



**Figure S4** FESEM images of (a) 3D urchin-like  $\text{TiO}_2$  microspheres and (b) wide size distribution of 3D urchin-like  $\text{TiO}_2$  microspheres with the average particle size is  $1.78 \pm 0.68 \mu\text{m}$ .