nanomaterials

Supplementary Materials

Metal–Organic-Framework-Derived Ball-Flower-like Porous Co_3O_4/Fe_2O_3 Heterostructure with Enhanced Visible-Light-Driven Photocatalytic Activity

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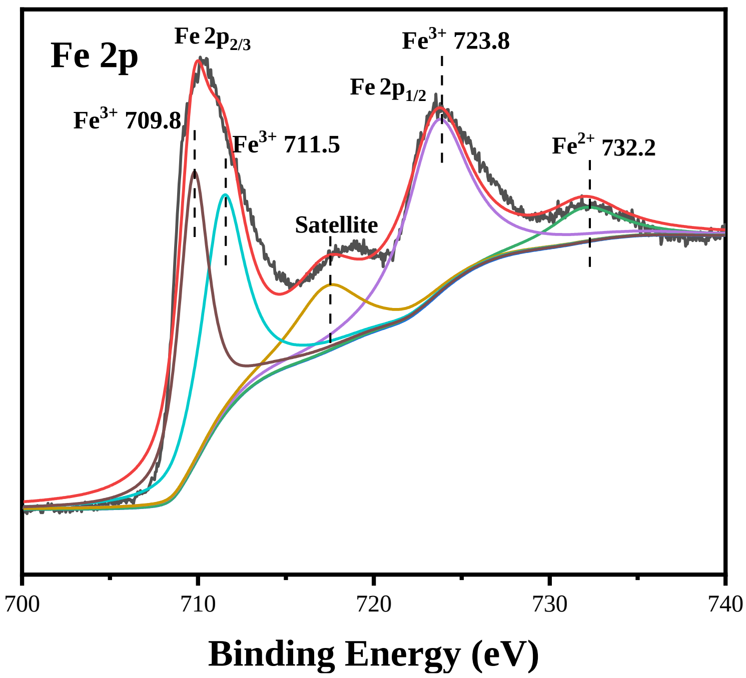

Figure S1. Fe 2p XPS spectrum of as-synthesized CF catalyst.

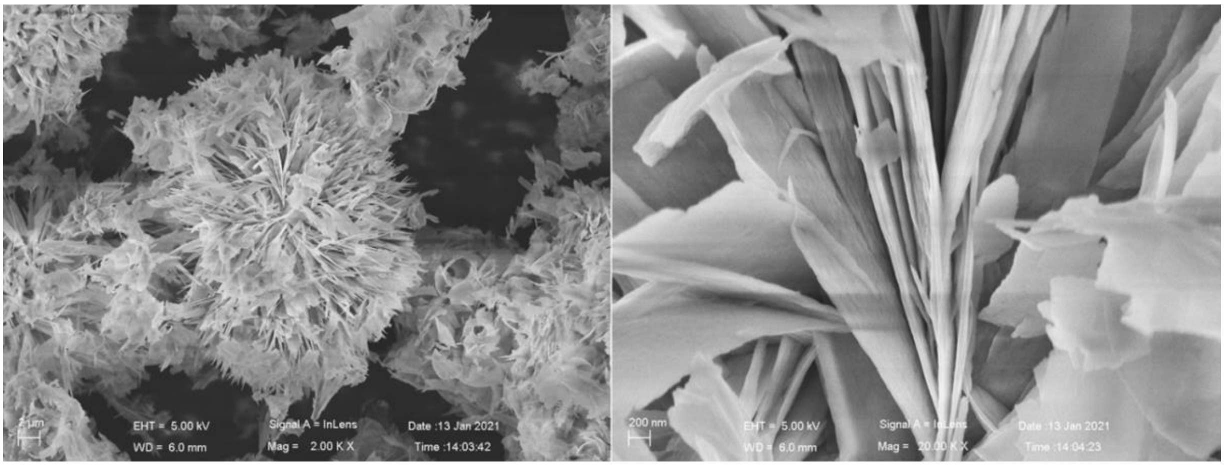

Figure S2. SEM images of pure Co-TDC at different magnifications.

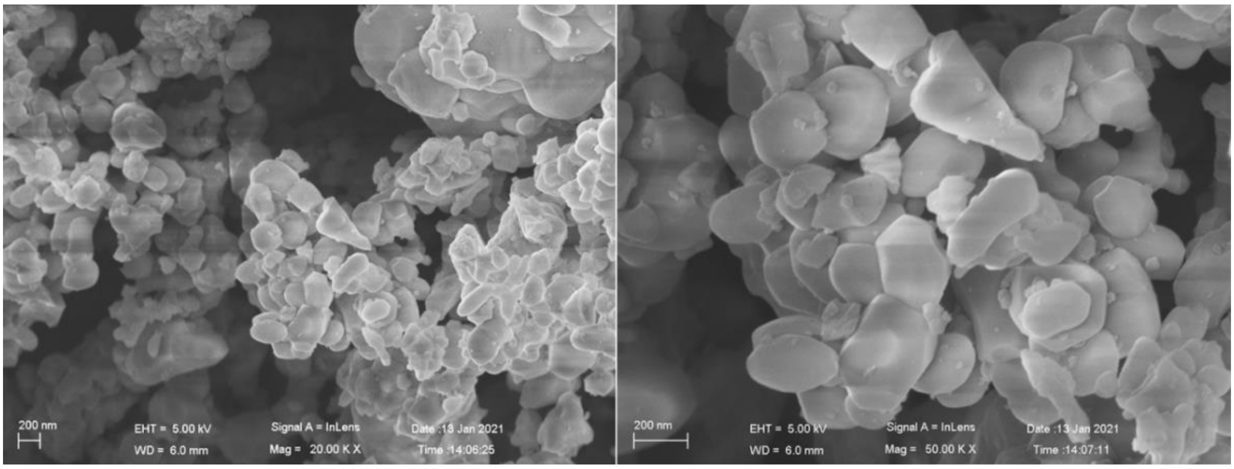

Figure S3. SEM images of pure Fe_2O_3 at different magnifications.

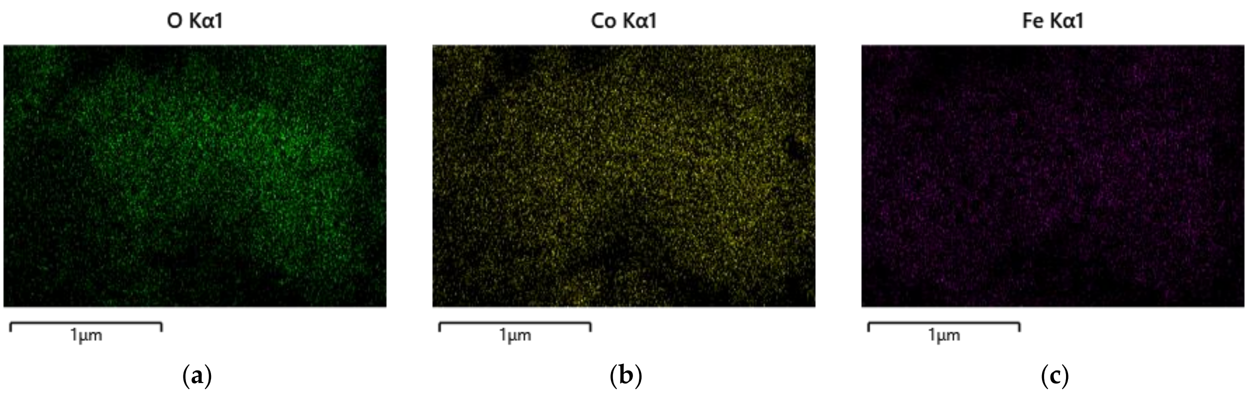

Figure S4. Elemental mapping profiles of as-synthesized CF catalyst: (**a**) O Kα1, (**b**) Co Kα1, (**c**) Fe Kα1.

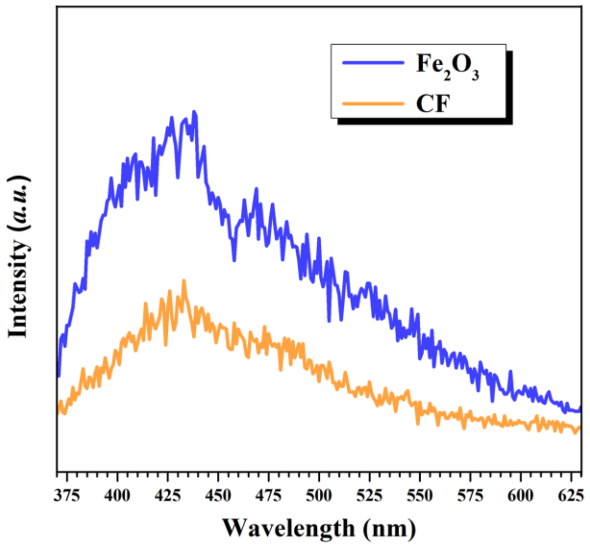

Figure S5. PL spectra of CF catalyst comparing with pure Fe_2O_3 at excitation wavelength of 355 nm.

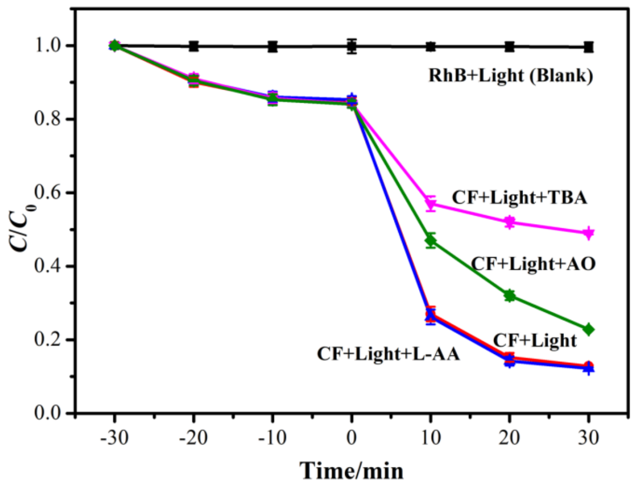

Figure S6. Photocatalytic degradation efficiency of RhB with and without quenching agent.

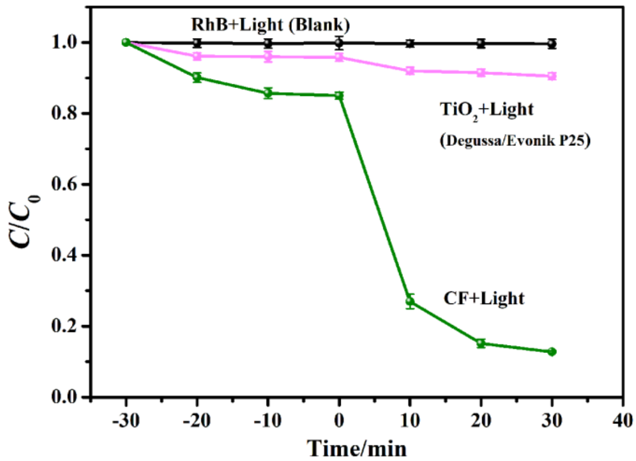

Figure S7. Photocatalytic degradation efficiency of RhB by as-synthesized CF catalyst comparing with commercial Degussa/Evonik P25-TiO_2 catalyst.

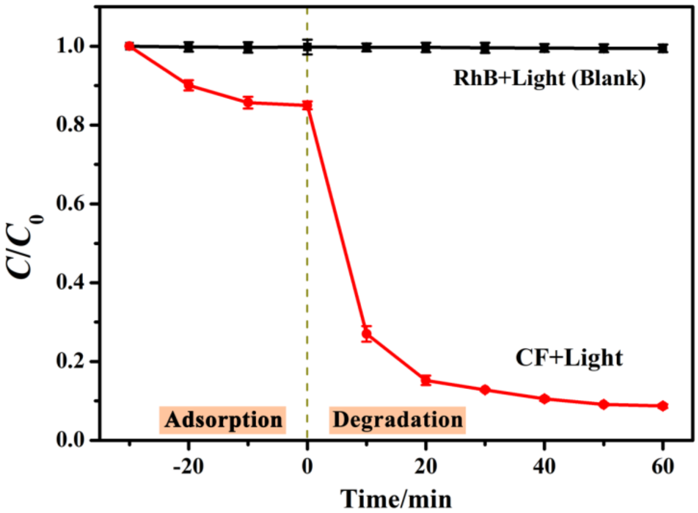

Figure S8. Photocatalytic degradation efficiency of RhB by CF over a prolonged period of time.

Experimental biota for toxicity test and algae density measurement

Chlorella vulgaris (FACHB-8) was obtained from the Freshwater Algae Culture Collection of the Institute of Hydrobiology at the Chinese Academy of Sciences (Wuhan, China). The blue-green algae medium (BG11) was used for culturing of *C. vulgaris*, and all the experiments were carried out at the same conditions: 40–80 μE m^{-2} s^{-1}, 25 ± 2 °C, pH = 7.1. Algae in the logarithmic growth phase were used for toxicity experiments. The algae density-absorbance curve was plotted based on the algae absorbance and the *C. vulgaris* counting results. A series density of the algae solutions was prepared, the absorbance was measured at 680 nm with a 7600 UV–visible spectrophotometer, and then the corresponding densities of *C. vulgaris* were counted under an Olympus optical microscope (CKX41, Japan) on a hemocytometer (Marienfeld, Germany). All samples were counted more than three times when the statistical results difference between each sample was less than 10%. In the subsequent experiments, the algae density could be calculated by measuring the absorbance based on the recorded absorbance-density curve. Except for the algae cell density in algae beads, it was counted under the microscope after beads were dissolved.