

Supporting information

Oxygen vacancies modified TiO₂ nanoparticles as enhanced visible-light driven photocatalyst by wrapping and chemically bonding with graphite-like carbon

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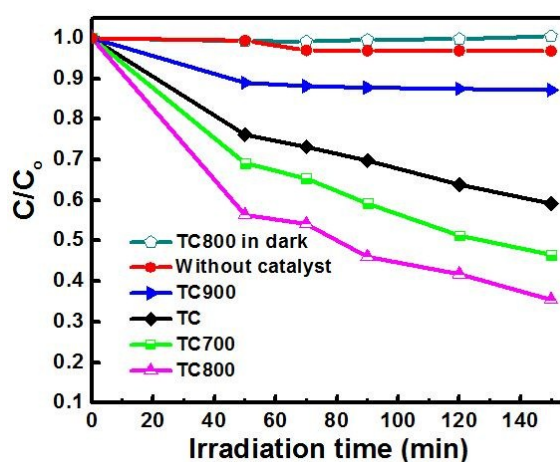


Fig. S1 Photocatalytic degradation of RhB over photocatalysts treated with different annealing temperatures under visible light.

The TC sample annealed at 700 °C, 800 °C and 900 °C are denoted as TC700, TC800 and TC900 respectively. And to determine the optimum annealing temperature, the three samples are also used to degrade RhB under the same condition. As shown in Fig. S1, TC800 exhibits better photocatalytic activity than any other annealed sample in the photo, suggesting that annealing at 800 °C is the best choice. Meanwhile, TC800 also shows significantly enhanced property, compared to TC.

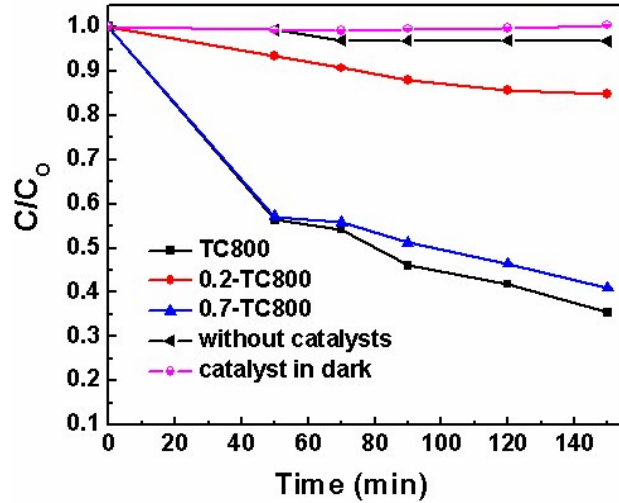


Fig. S2 Photocatalytic degradation of RhB over photocatalysts with different thickness of graphite-like carbon under visible light.

A series of experiments with the single variable of different glucose concentrations were carried out after the optimum annealing temperature was determined. The molar concentrations of glucose solution were set to 0.2M, 0.5M and 0.7M respectively. After the hydrothermal reaction, all the samples were annealed at 800 °C to figure out the appropriate thickness of graphite-like carbon. And they were accordingly named as 0.2TC-800, 0.5TC-800 (i.e. TC800) and 0.7TC-800. By degrading RhB under the same condition, the degradation rates of 0.2TC-800, TC800 and 0.7TC-800 were 15.2%, 64.5% and 58.9%, indicating that the thickness of carbon layer in TC800 was appropriate.

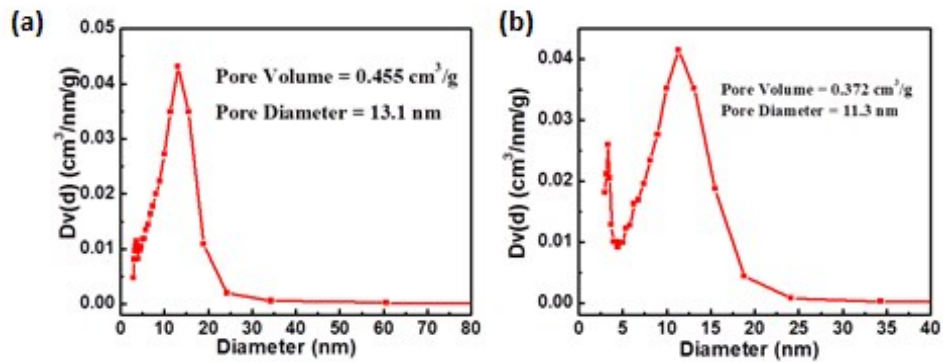


Fig. S3 Pore size distributions of (a) TC and (b) TC800

Table S1 Comparison of D_1 with previous literatures with the same degradation time of RhB under visible light for 150 min.

Materials	degradation agent	mass of RhB	mass of catalyst (g)	D	D_1 (min ⁻¹)
Carbon-TiO ₂ nanohybrids ²³	RhB	100 mL*20 mg/L	0.155	0.76	0.0654
Mesoporous carbon-doped crystalline TiO ₂ ²⁴	RhB	100 mL*5 mg/L	0.1	0.35	0.0117
TC800 (our sample)	RhB	40 mL*10 mg/L	0.005	0.645	0.344