Supplementary Materials

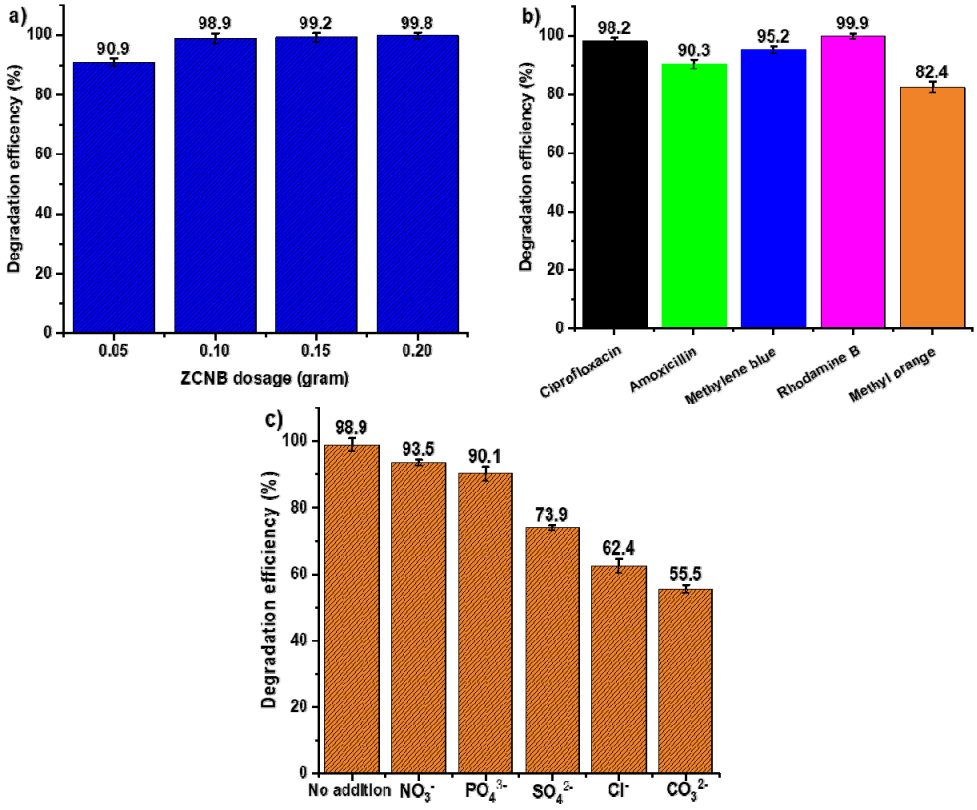

Fig. S1 a) Effects of ZCNB dosage on the photocatalytic degradation of DC (Mass of catalyst: 0.1 gram; DC concentration of 25 mg·L^{-1}; the volume of 200 mL (pH~5); time for dark adsorption is 60 min and for illumination is 120 minutes); b) Degradation experiments for the removal of various contaminant with ZCNB within 120 min under visible light (operational conditions: ZCNB: 0.1 g, pH: 5.0 and DC: 25 mg L^{-1}) and c) Effect of inorganic anions on photocatalytic degradation of DC by ZCNB (Mass of catalyst: 0.1 gram; DC concentration of 25 mg·L^{-1}; the volume of 200 mL (pH~5); anion/DC molar ratio of 20.5; time for dark adsorption is 60 min and for illumination is 120 minutes).

Table S1. Photodegradation efficiency (PE%) of DC on samples: ZnO, g-C_3N_4 and ZCNB-x composite samples

Samples	Mass ratio of ZnO/g-C_3N_4/BC (g/g/g)	PE(%)
ZnO	2/0/0	9.42
g-C_3N_4	0/1.0/0	48.09
ZCN	2/1.0/0	69.74
ZCNB-0,25	2/.0/0.25	85.12
ZCNB-0,50	2/1.0/0.50	98.92
ZCNB-0,75	2/1.0/0.75	89.71
ZCNB-1,00	2/1.0/1.00	80.21

Table S2. Photodegradation efficiency of DC (PE%) on ZCNB samples at different calcination temperatures

Notation	Calcination temperature (°C)	*PE* (%)
ZCNB400	400	90.15
ZCNB450	450	98.17
ZCNB500	500	95.12
ZCNB550	550	90.18
ZCNB600	600	86.13

Table S3. The average crystalline size (*D*), and band gap energy (E_g) of the synthesized samples

Samples	ZnO	g-C_3N_4	ZCN	ZCNB
D (nm)	30.3	-	26.6	24.0
E_g (eV)	3.18	2.79	2.66	2.53

Table S4. N_2 physical absorption characteristics of ZnO, g-C_3N_4, biochar and ZCNB

	ZnO	g-C_3N_4	Biochar	ZCN	ZCNB
Specific surface area ($m^2.g^{-1}$)	5.5	36.8	22.8	25.4	25.1
Pore volume ($cm^3.g^{-1}$)	0.02	0.16	0.01	0.15	0.14
Average pore diameter (nm)	16.9	31.29	12.43	35.02	28.93

Table S5. A comparison of the rate constant of doxycycline degradation with the previous reports

Catalysts	E_{bg} (eV)	Light source	C_0 ($mg·L^{-1}$) /Vol. (mL) /$m_{catalyst}$ (mg)	*k* (min^{-1})	Ref.
ZnO/g-C_3N_4/biochar	2.53	50W Compact lamp with a 420 nm cutoff filter	25/200/100	0.06905	The present work
$NiFe_2O_4$/MWCNTs/BiOI	2.41	An ultraviolet lamp (20 W, 395 nm)	45/80/125	0.00720	[1]
g-C_3N_4 + H_2O_2	2.56	300 W of simulated sunlight	20/100/100	0.01800	[2]
In_2O_3 + H_2O_2	2.76	300 W of simulated sunlight	20/100/100	0.05800	[2]
In_2O_3/g-C_3N_4	2.56-2.76	300 W of simulated sunlight	20/100/100	0.00880	[2]
30-FPMG NCs + H_2O_2	2.92	1000 W halogen lamp	75/20/1	0.01000	[3]
g-C_3N_4/$Ni_{0.5}Zn_{0.5}Fe_2O_4$	2.35	Solar ligh	20/100/30	0.08300	[4]
Co/Mn-MOF-74@g-C_3N_4	1.73	300 W halogen lamp with a 420 nm cutoff filter	40/40/50	0.00459	[5]

Table S6. The characteristics of the shrimp aquaculture wastewater

	pH	TOC[a] (mg/L)	COD[a] (mg/L)	DO[a] (mg/L)	NH_4^+-N (mg/L)	PO_4^{3-}-P (mg/L)
Before degradation	7.5	40.1	120.5	4.1	31.2	10.4
After degradation	8.2	10.8	15.6	0.1	1.5	2.3

[a] TOC-Total Organic Carbon; COD-Chemical Oxygen Demand; DO-Dissolved Oxygen

Reference

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