Alkali Metal Assisted Synthesis of Graphite Carbon Nitride with Tunable Band-Gap for Enhanced Visible-Light-Driven Photocatalytic Performance

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Total number of pages: 14

Total number of figures: 10

Total number of tables: 2

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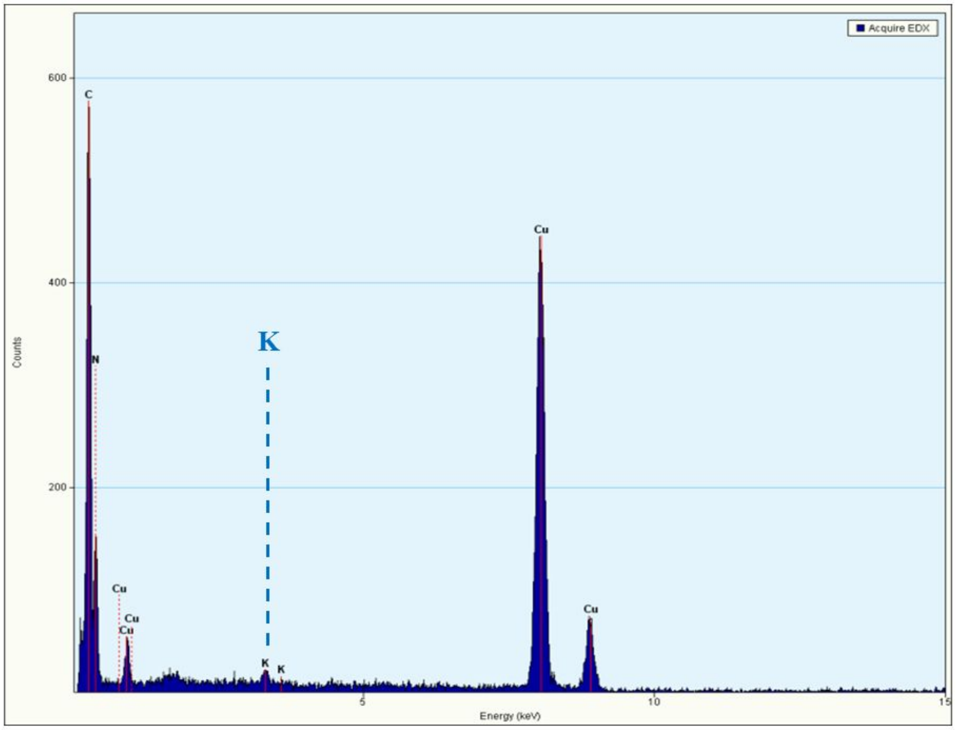


Figure S1. TEM EDS spectrum of KMCN (0.05).

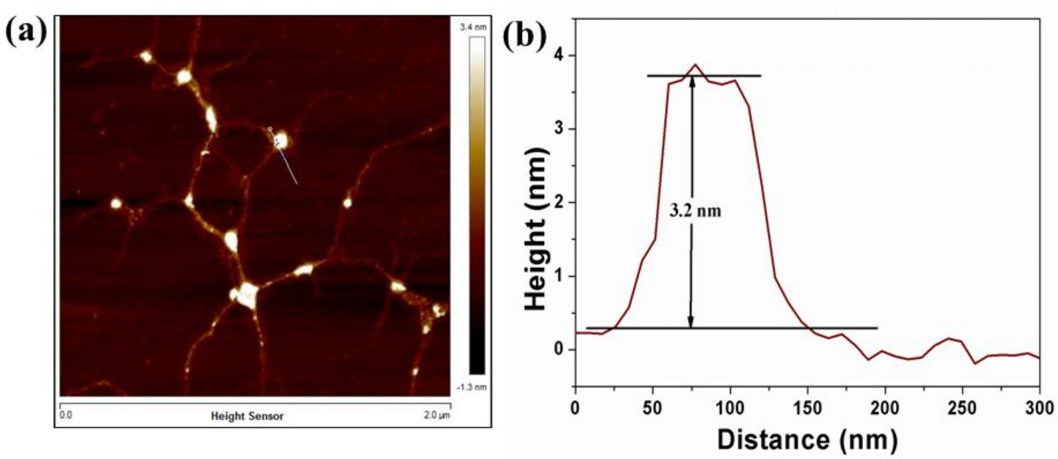


Figure S2. (a) AFM image and (b) the height distribution profile of KMCN (0.05).

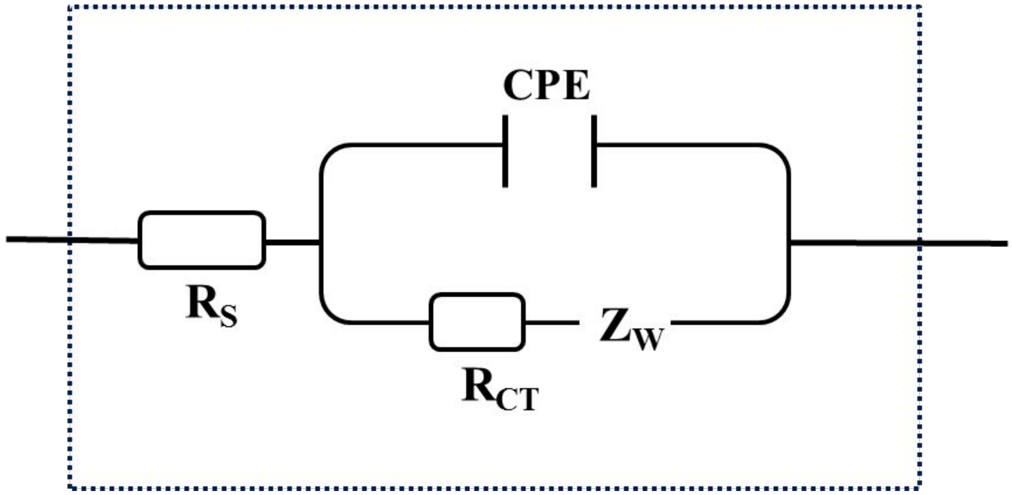


Figure S3. Equivalent circuit diagram: R_s is the Ohmic resistance of the electrolyte; R_{CT} is the charge transfer resistance; Z_w is Warburg impedance, and CPE is constant phase element. The measured EIS data can be simulated with this equivalent circuit.

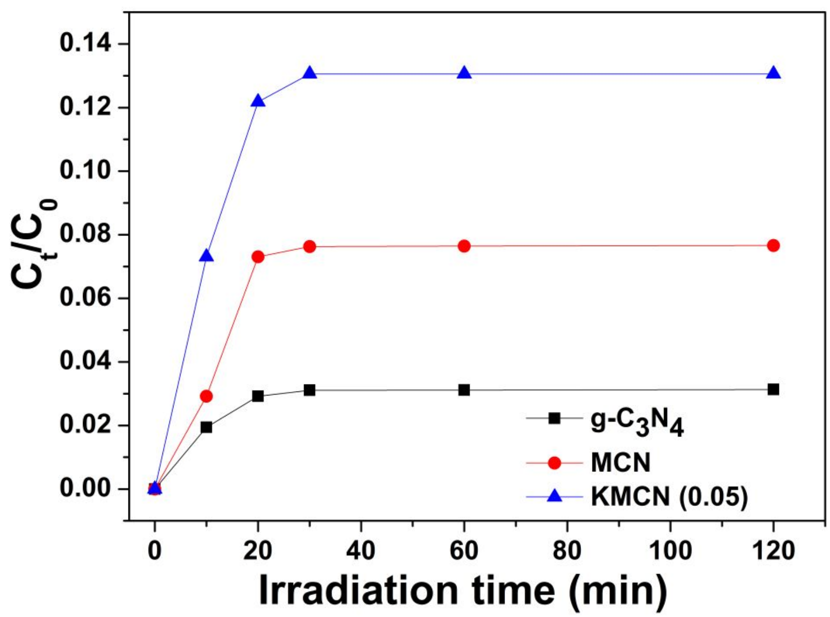


Figure S4. Adsorption ability evaluation for TC pollutants by bulk g-C_3N_4, MCN and KMCN (0.05) catalysts in the darkness.

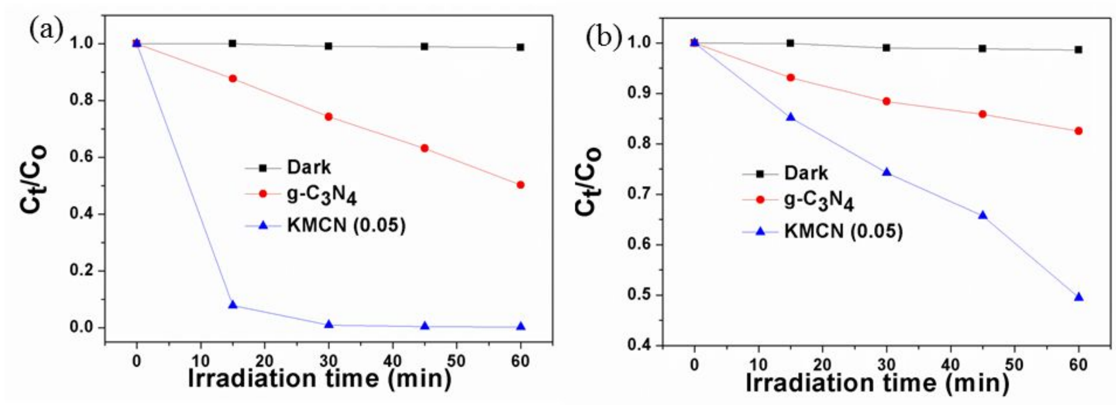


Figure S5. Photocatalytic degradation of (a) Rhodamine B (10mg/L) and (b) ciprofloxacin (10mg/L) over g-C_3N_4 and KMCN (0.05).

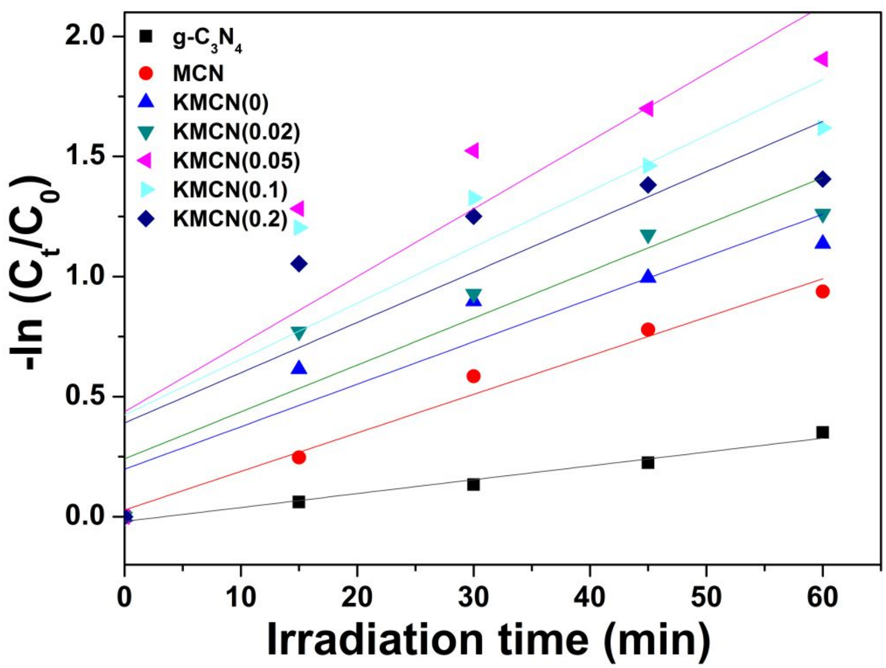


Figure S6. Pseudo-first-order kinetics of TC degradation by bulk g-C_3N_4, MCN and KMCN (x) catalysts.

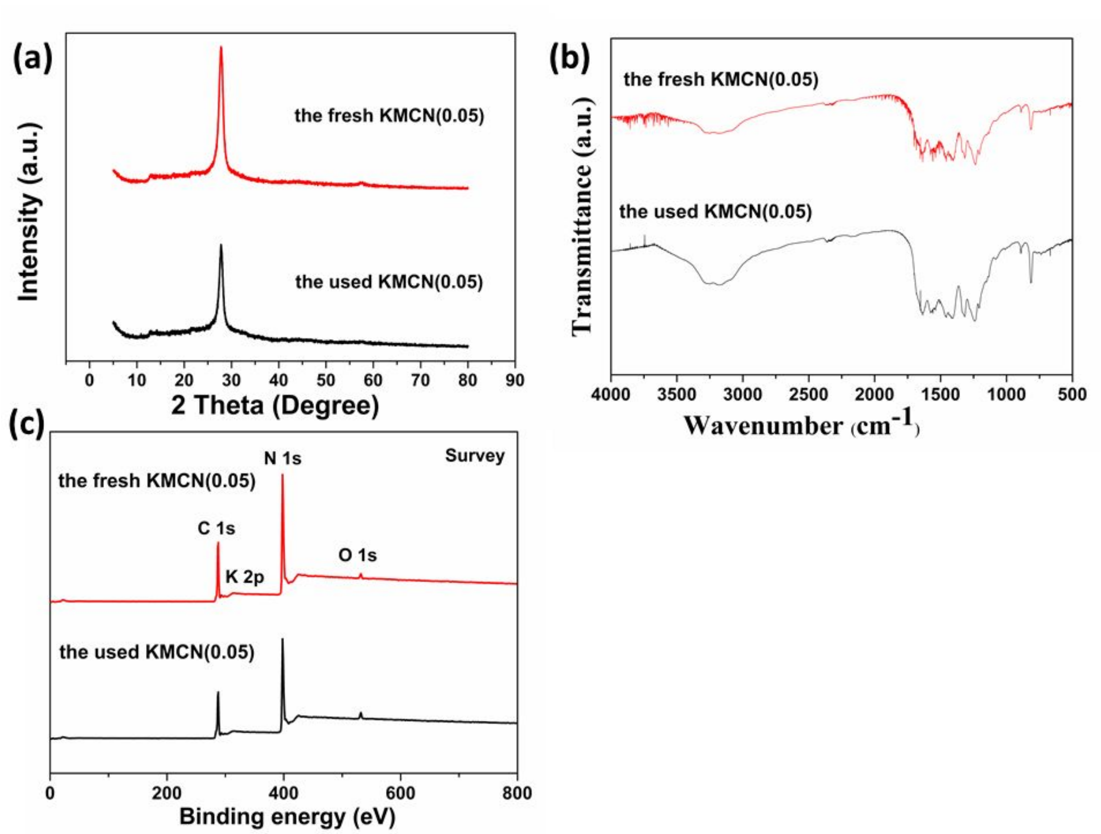


Figure S7. (a) XRD, (b) FT–IR and (c) XPS survey for fresh and used KMCN (0.05) sample.

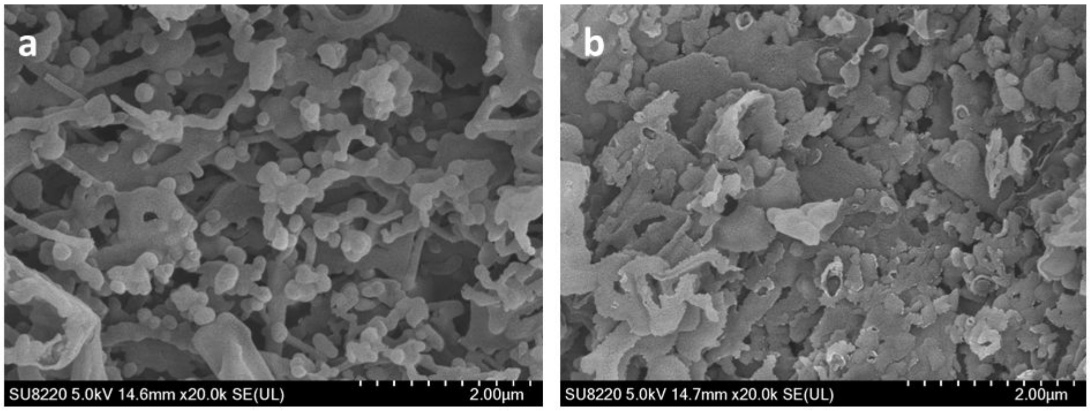


Figure S8. SEM images for (a) fresh sample and (b) used sample.

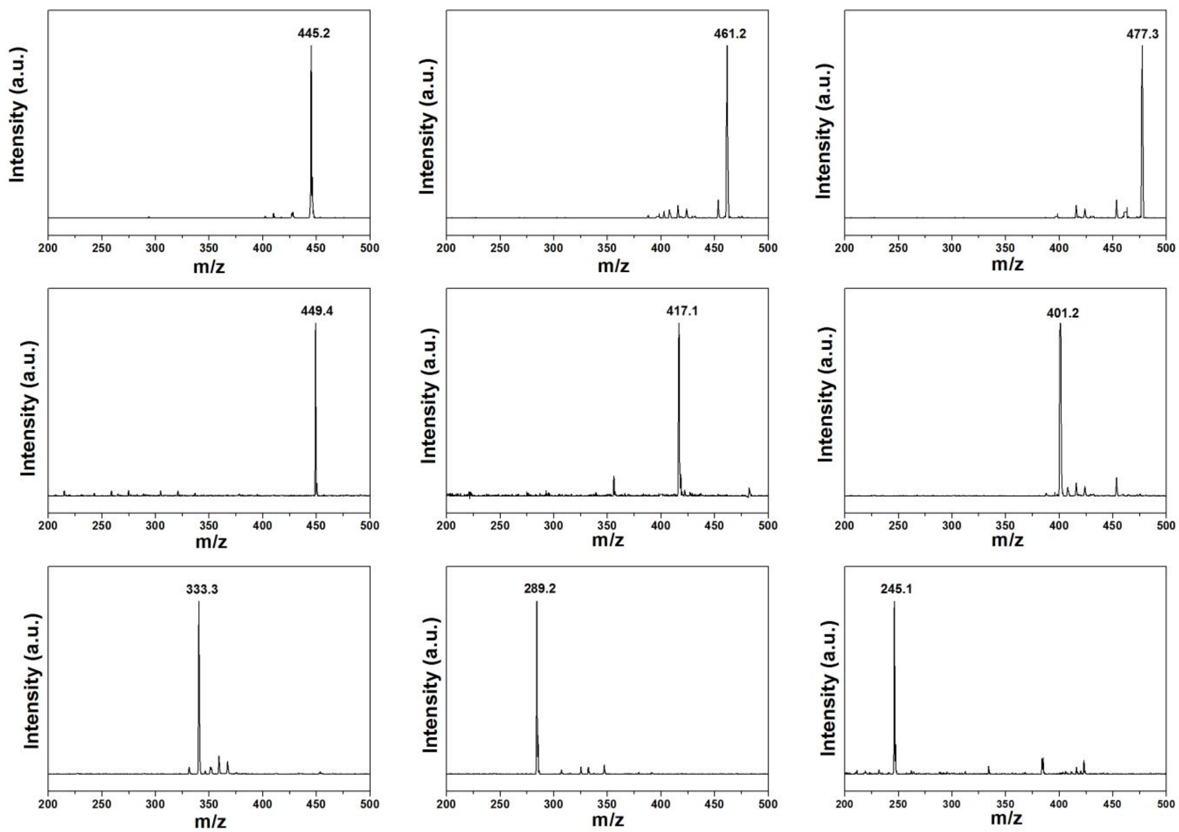


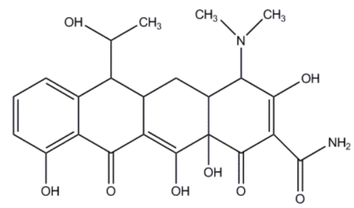
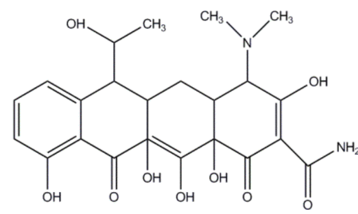
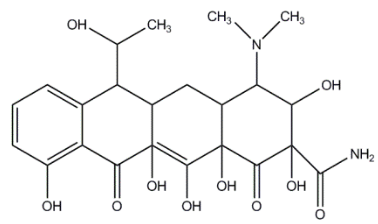
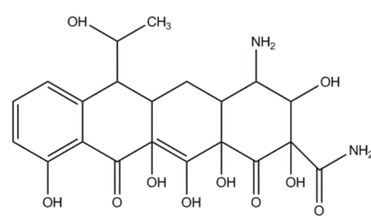
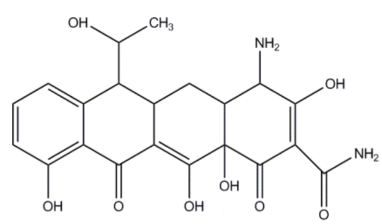
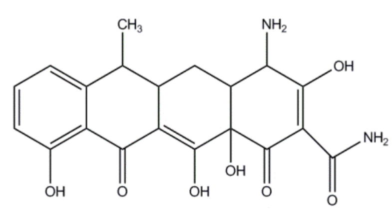
Figure S9. MS spectra of the TC and possible intermediates.

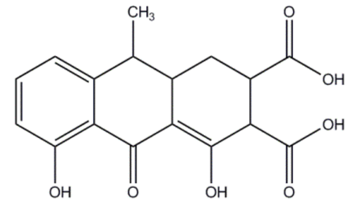
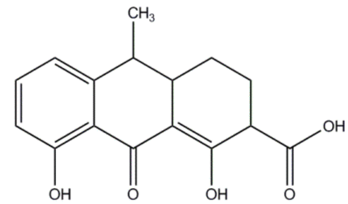
Figure S10. The concentration of intermediate product H_2O_2 detected by the test paper.

Table S1. Fitting values of the equivalent circuit elements from the electrochemical impedance spectroscopy Data

Samples	R_{CT} (Ω)	R_S (Ω)	CPE(F)	Z_W (mΩ/$s^{1/2}$)
g-C_3N_4	3.31×10^4	38.76	9.62×10^{-5}	2.01
MCN	3.20×10^4	37.34	8.87×10^{-5}	1.46
KMCN (0.05)	2.87×10^4	34.59	1.24×10^{-5}	1.14

Table S2. The structural information of the possible intermediates products.

Compounds	Formula	m/z	Proposed structure
TC	$C_{22}H_{24}N_2O_8$	445	
TC 1	$C_{22}H_{24}N_2O_9$	461	
TC 2	$C_{22}H_{24}N_2O_{10}$	477	
TC 3	$C_{20}H_{20}N_2O_{10}$	449	
TC 4	$C_{20}H_{20}N_2O_8$	417	
TC 5	$C_{20}H_{20}N_2O_7$	401	

TC 6	$C_{17}H_{16}O_7$	333	
TC 7	$C_{16}H_{16}O_5$	289	
TC 8	$C_{15}H_{16}O_3$	245