Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supporting Information

Metal-Free Activation of H_2O_2 by g-C_3N_4 with Visible Light Irradiation for Degradation of Organic Pollutants

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Fig. S1 Transmittance of the combined cutoff filters.

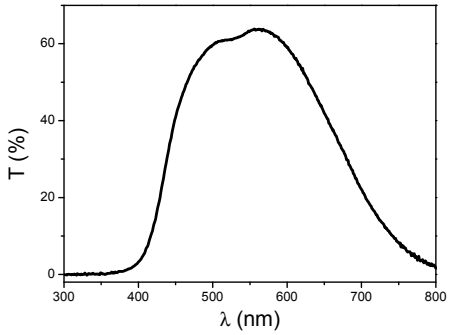


Fig. S2 Visible-light photocatalytic activities of RhB (10^{-5}M) over the g-C_3N_4 obtained at different temperatures.

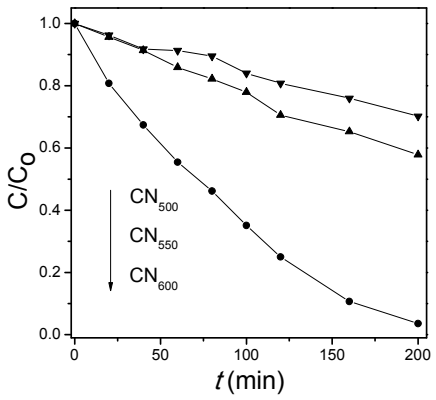


Fig. S3 PL spectrum of g-C_3N_4 obtained at different temperatures

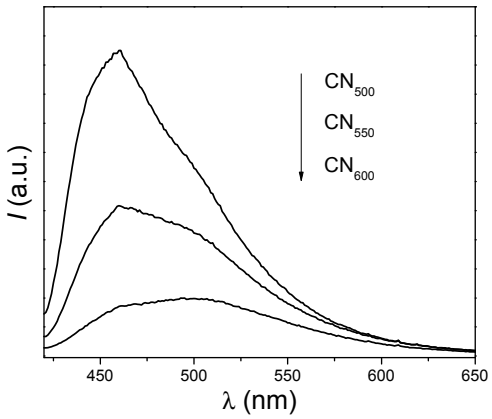


Fig. S4 Photodegradation rate of RhB (10^{-5}) by CN_{600} with different concentration of H_2O_2 under visible light irridation.

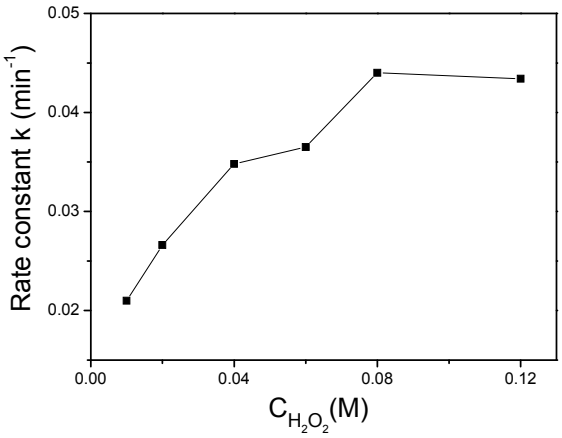
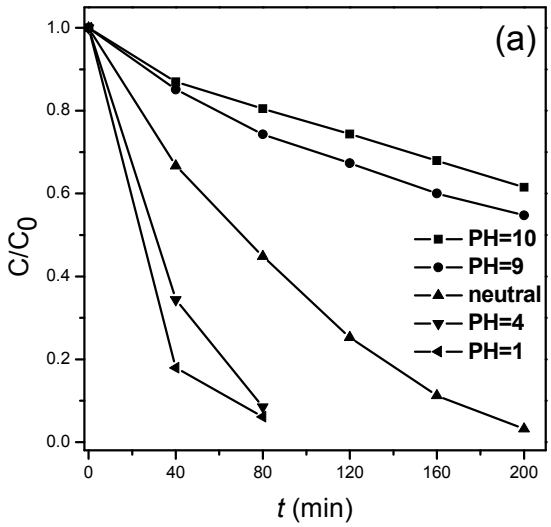


Fig. S5 Photodegradation of RhB (10^{-5}) at different pH conditions. (a)CN_{600}/RhB, (b) CN_{600}/RhB/0.08M H_2O_2.



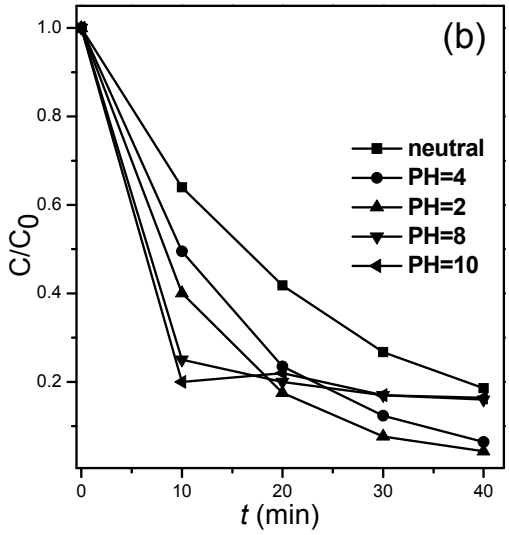


Fig. S6 The possible isomeric compounds (and possible configurations) of the degradation fragments of RhB with different m/z values.

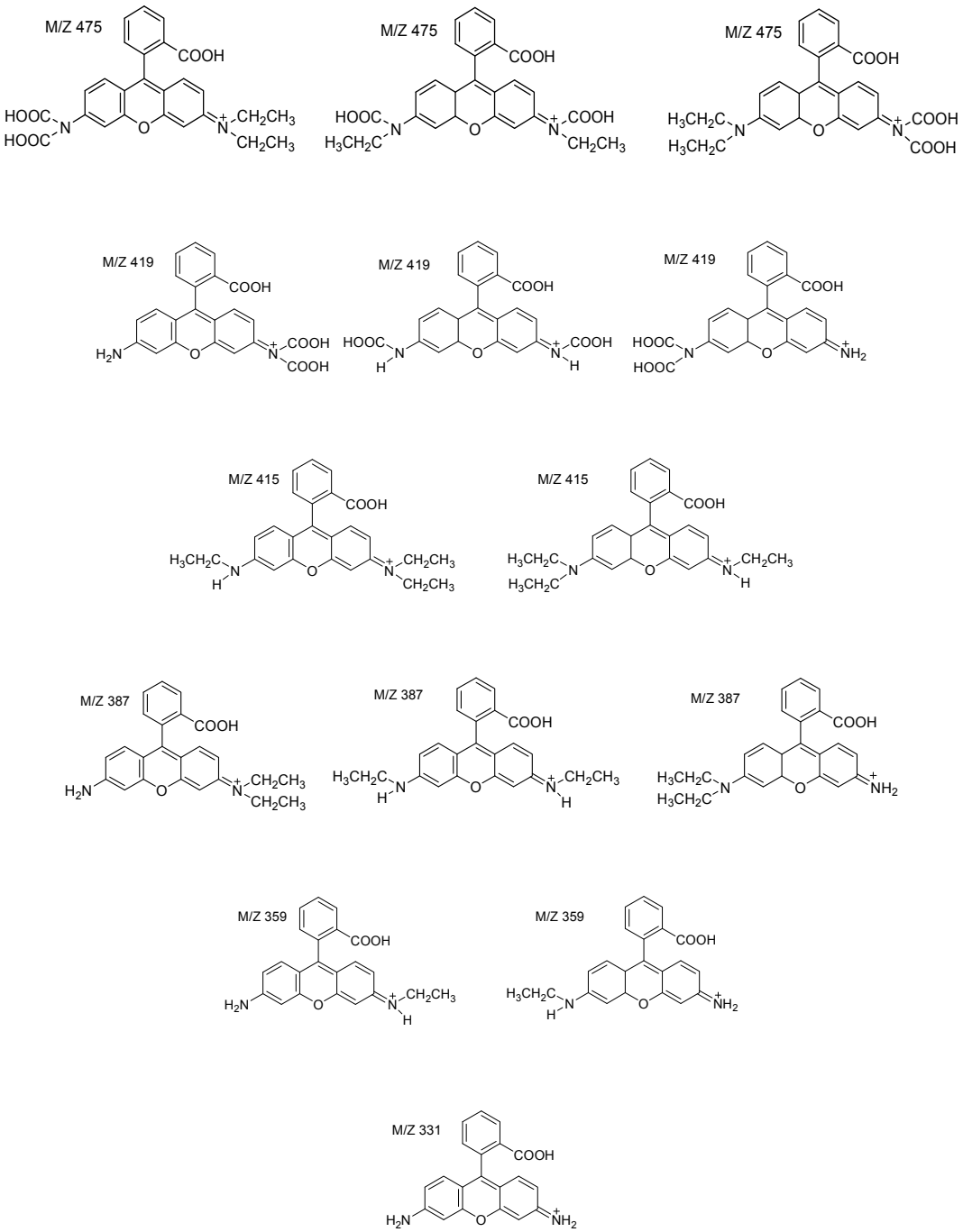


Fig. S7 The XRD and FTIR patterns of CN_{600} before and after used for the photocatalytic reaction in RhB degradation with H_2O_2 (0.08M).

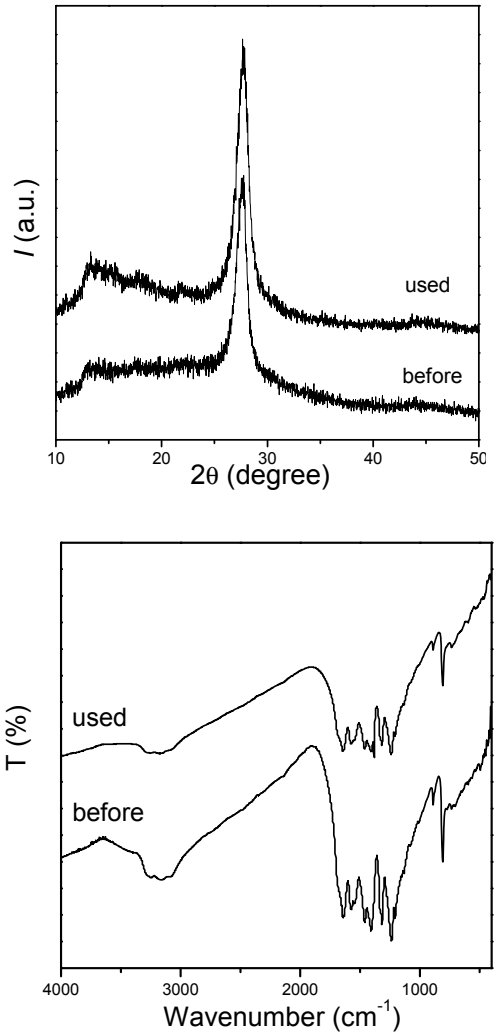


Table S1. RhB (10^{-5}) adsorption/desorption equilibrium in dark on the surface of CN_{600}.

Time (min)	0	5	10	15	20	25	30
Absorbed amount (%)	0	5.6	11.7	12.5	12.7	11.8	12.2

Table S2. Adsorbed amount of RhB (10^{-5}) on the surface of CN_{600} in unneutral solutions.

AB[a]	AF[b]
11.4%	14.4% (pH=4)
11.8%	17.2% (pH=10)

[a] Adsorbed amount of RhB in dark for 30 min in neutral pH conditions.

[b] Adsorbed amount of RhB after adjust pH in dark for another 30 min (following the first step)

Table S3. TOC detection results of RhB (10^{-4}) photocatalytic reactions.

	TOC (mg/L)			
Dye	Original	Light-5h	Light-10h	Light-20h
RhB	58.4	22.6	21.9	20.1

Table S4. Photodegradation conversion(%) of various dyes by CN_{600} and CN_{600}/H_2O_2.

Entry	dye	CN_{600}	CN_{600}/H_2O_2 (0.08M)
1	[a,c]Rhodamine B	56.5	96.3
2	[b,d]Methylene blue	76.3	98.2
3	[b,e]Congo red	34.9	52.5

The reaction conditions were as follows: catalyst, 1g/L; neutral pH; H_2O_2, 0.08M.

[a] Initial concentration: 1×10^{-5}M.

[b] Initial concentration: 5mg/L.

[c] The dye conversion was obtained after visible light irradiation for 80 min.

[d] The dye conversion was obtained after visible light irradiation for 3h.

[e] The dye conversion was obtained after visible light irradiation for 30min.