Electronic Supplementary Information (ESI):

Sodium alkoxide-mediated *g*-C_3N_4 immobilized on a composite nanofibrous membrane for preferable photocatalytic activity

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1. General

Materials. The reagents of analytical grade were purchased from commercial sources and used without any further purification. PAN was purchased from Shanghai Lin En Technology Development Company. Bulk $_g$-C_3N_4 is made by our research group.

Instruments. The X-ray diffraction (XRD) measurements used a D/max 2500 XRD spectrometer (Rigaku) with a Cu Kα line of 0.1541 nm. Infrared (IR) spectra (4000–400 cm^{-1}) were recorded using a Nicolet FT–IR 170X spectrophotometer on KBr disks. The UV-vis diffuse reflectance spectra (DRS) were recorded on a Cary 500 UV-Vis-NIR spectrophotometer. The fluorescence spectroscopy was measured using a Shimadzu RF-5301 PC spectrometer. The morphology and element distribution of the electrospun fiber membrane were recorded by using a SU8010 electron microscope at an accelerating voltage of 5.0 kV. The specific surface areas of the samples were measured with a Micromeritics ASAP-2020 instrument and analyzed by the Brunauer-Emmett-Teller (BET) method. XPS investigation was carried out using a Thermo Scientific K-Alpha+ spectrometer with a mono X-ray source Al Kα excitation.

2. Experimental details

2.1. Syntheses of sodium alkoxide-mediated *g*-C_3N_4 photocatalysts

1) The bulk *g*-C_3N_4 powder was condensed from melamine. Sodium (1.00 g) was slowly added to MeOH, EtOH, and ^{t}BuOH solution (100 mL), respectively. Sodium and anhydrous MeOH, EtOH, and ^{t}BuOH solution were mixed at room temperature, atmospheric pressure under an argon atmosphere. There will be bubbles in the reaction of sodium and alcohol (need to be carried out in the fume hood).

2) The mixture was continuously stirred for 2 h until the sodium reacts to completed. When the metal sodium disappears completely, there will be no bubbles in the reaction, that is, the reaction of sodium and alcohol solution ends.

3) Then, *g*-C_3N_4 powder (1.00 g) was added to the solution and heated to reflux overnight.

4) After this reaction, the mixture was filtered to obtain the yellow precipitate, which was washed to neutral and dried at 105 °C for 24 h. The obtained samples were labelled *g*-C_3N_4-MeONa, *g*-C_3N_4-EtONa, and *g*-C_3N_4-

^{t}BuONa by the yield of 92~97%, respectively, according to different sodium alkoxide.

Also, sodium alkoxide has been purchased directly and the 2)~4) method of preparing the solution is same (need to control the concentration of sodium alkoxide in alcohols solvent). Sodium element (1.00 g) is related with *g*-C_3N_4 powder (1.00 g).

2.2. Syntheses of PAN/g-C3N4-tBuONa floating photocatalysts

1) Powder *g*-C_3N_4-^{t}BuONa (0.80 g) was dissolved in *N*,*N*-dimethylformamide (DMF, 10 mL) and was exfoliated by ultrasonic treatment for 30 minutes followed by polyacrylonitrile (PAN, 1.20 g) powders. DMF is a good organic solvent to dissolve the polymer PAN, so as to form a uniform electrospun solution. DMF has a certain volatility, accompanied by a certain degree of ventilation in the process of high-pressure electrospun, under the condition of rapid air circulation and high-pressure injection DMF can be volatile.

2) The precursor PAN/*g*-C_3N_4-^{t}BuONa solution was obtained for electrospun. PAN solution was also prepared by the same procedure without *g*-C_3N_4-^{t}BuONa for comparison.

3) Electrospun conditions: A voltage of ~10 kV and a distance of 6~8 cm were used between the syringe tip (10 mL). The counter electrode was covered by aluminium foil (supply speed: ~0.6 mL/h; roller speed: ~300 r/min).

4) After electrospun, the products on the collector were placed in the oven and dried at 80 ℃ for 12 h to remove the residual DMF and to prepare the *g*-C_3N_4-^{t}BuONa floating photocatalyst.

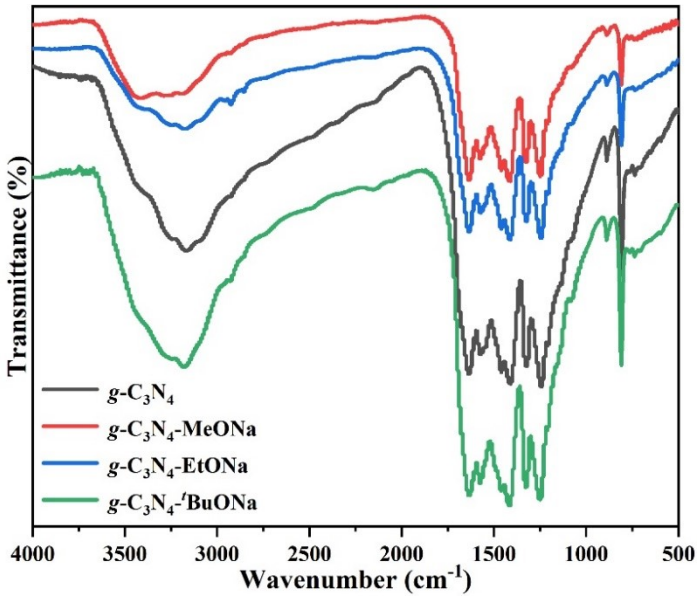


Fig. S1 FT−IR spectra of bulk *g*-C_3N_4, *g*-C_3N_4-MeONa, *g*-C_3N_4-EtONa and *g*-C_3N_4-^{t}BuONa samples.

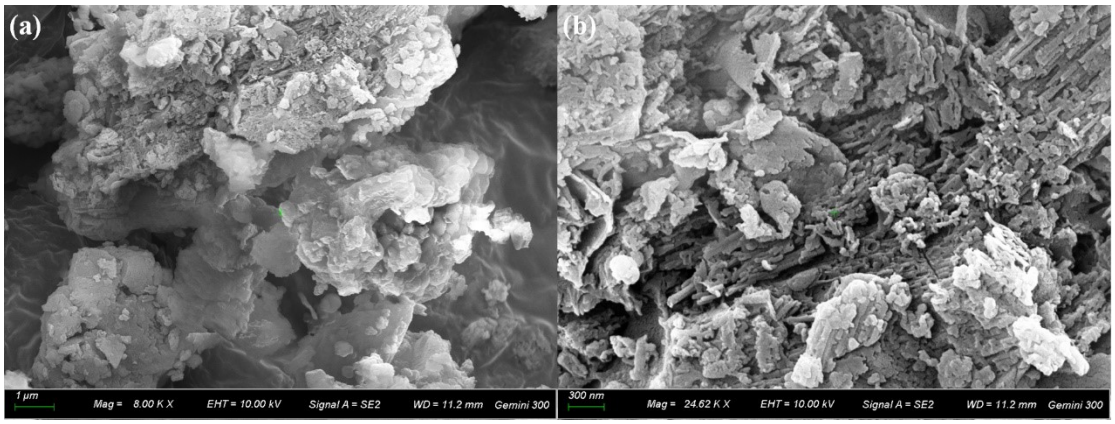


Fig. S2 SEM image of *g*-C_3N_4-MeONa

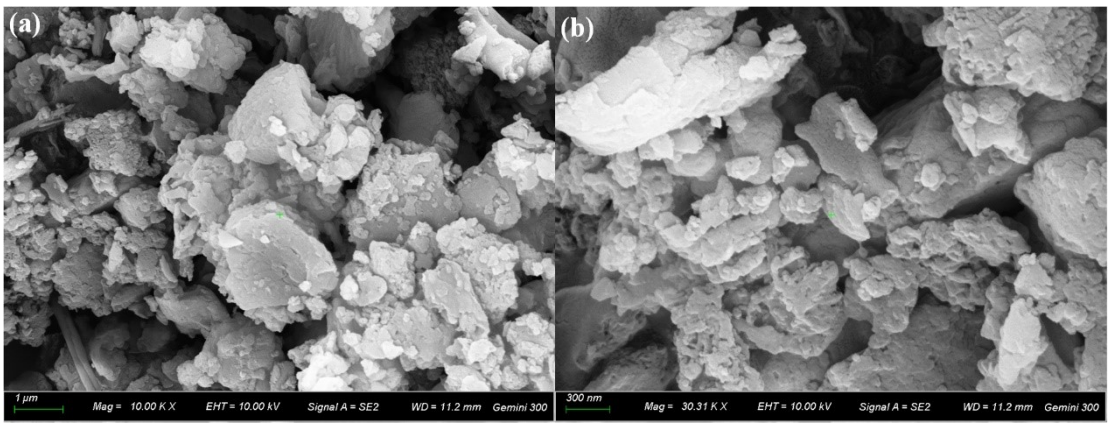


Fig. S3 SEM image of *g*-C_3N_4-EtONa

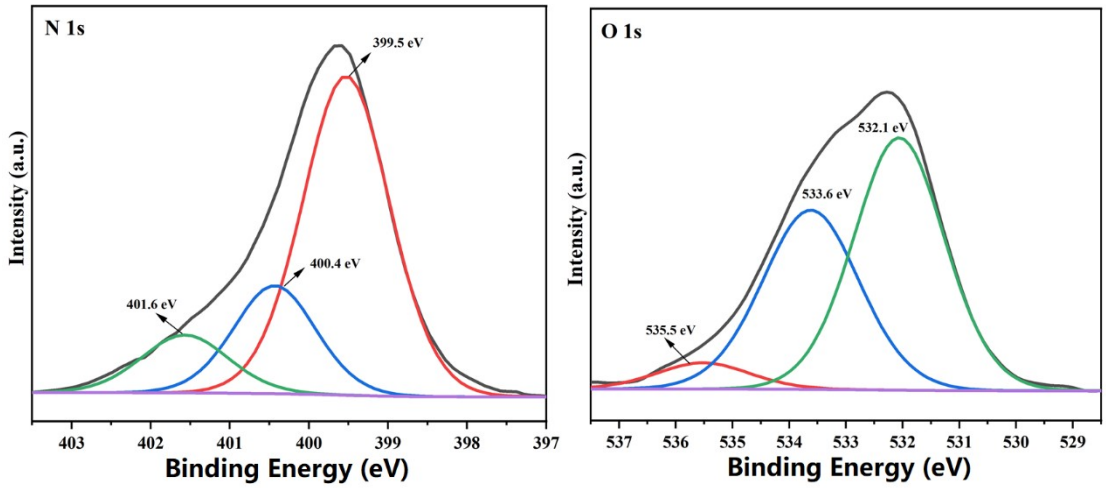


Fig. S4 N 1s and O 1s core-level spectra of PAN/*g*-C_3N_4-^{t}BuONa.

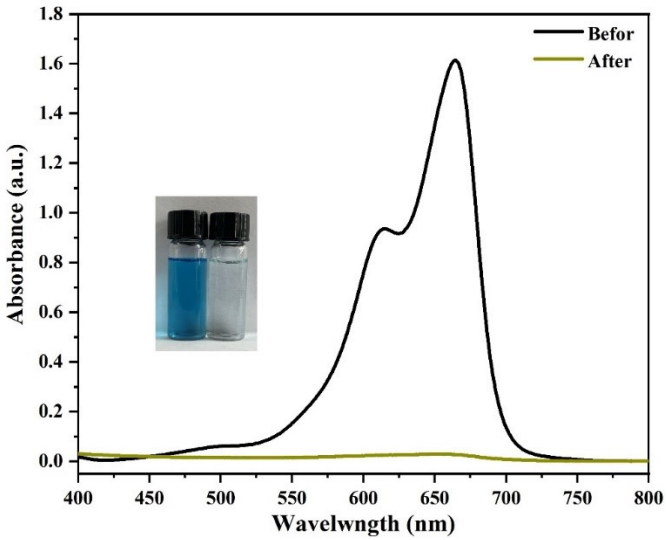
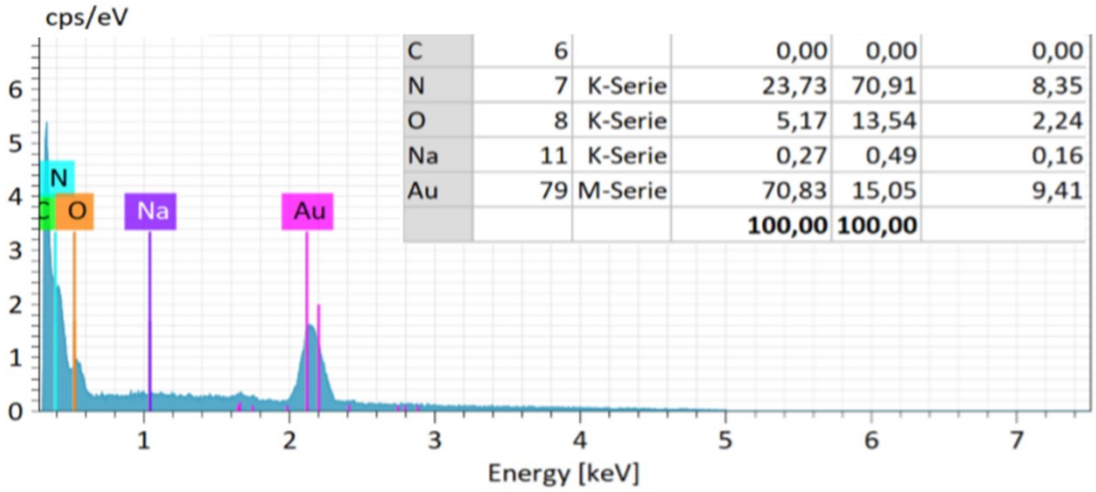


Fig. S5 UV−Vis absorption spectra of MB dye for PAN/*g*-C_3N_4-^{t}BuONa photocatalytic degradation (inset: the visual pictures of MB solution under illumination at 0 min and 180 min).



C	6		0,00	0,00	0,00
N	7	K-Serie	23,73	70,91	8,35
O	8	K-Serie	5,17	13,54	2,24
Na	11	K-Serie	0,27	0,49	0,16
Au	79	M-Serie	70,83	15,05	9,41
			100,00	**100,00**	

Fig. S6 EDS data of *g*-C_3N_4-^{t}BuONa.

Table S1 Changes in surface area of bulk *g*-C_3N_4, *g*-C_3N_4-MeONa, *g*-C_3N_4-EtONa and *g*-C_3N_4-^{t}BuONa.

samples	Bulk *g*-C_3N_4	*g*-C_3N_4-MeONa	g-C_3N_4-EtONa	*g*-C_3N_4-^{t}BuONa
Specific surface area/m^2 g^{-1}	9.11	10.97	11.28	11.51