

Reusable isotype heterojunction g-C₃N₄/alginate hydrogel spheres for photocatalytic wastewater treatment

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1. Characterization of g-C₃N₄ synthesized from different raw materials

Methods

Sample Hydrodynamic diameters were measured by dynamic light scattering (DLS) using a Beckman Coulter (Brea, CA, USA) DelsaMax Pro. Simultaneously, sample electrophoretic mobilities in ultrapure water were measured, and the zeta potential was determined based on the following Smoluchowski equation (Eq. 1):

$$v = \varepsilon \zeta E / \mu \quad (1)$$

where v is the electrophoretic mobility, ε is the dielectric constant of the solvent, ζ is the zeta potential, E is the electric field, and μ is the viscosity of the solvent.

Table S1. Characterization of g-C₃N₄ synthesized from different raw materials.

Samples	Band gap (eV)	BET specific surface	Hydrodynamic	Zeta potential (mV)
		area (m ² g ⁻¹)	diameter (nm)	
CN-TU	2.68	78.56	1204	-42.16
CN-MU	2.60	37.68	918	-53.46
CN-U	2.72	64.94	615	-47.13
CN-T	2.58	23.01	1247	-55.04
CN-M	2.54	9.67	1220	-57.24

2. Change in elastic modulus of g-C₃N₄/Alg beads under visible light irradiation

Method

The compressive strength of the beads was measured using an A&D (Tokyo, Japan) STB-1225S universal testing machine equipped with a load cell (50 N). The elastic modulus was determined based on the data within 0–20% of the strain range by using the following Hertz model (Eq. 1):

$$F = 4/3 ED^{0.5}\Delta D^{1.5} \quad (1)$$

where F is the load, E is the modulus of elasticity, D is the bead diameter, and ΔD is the displacement.

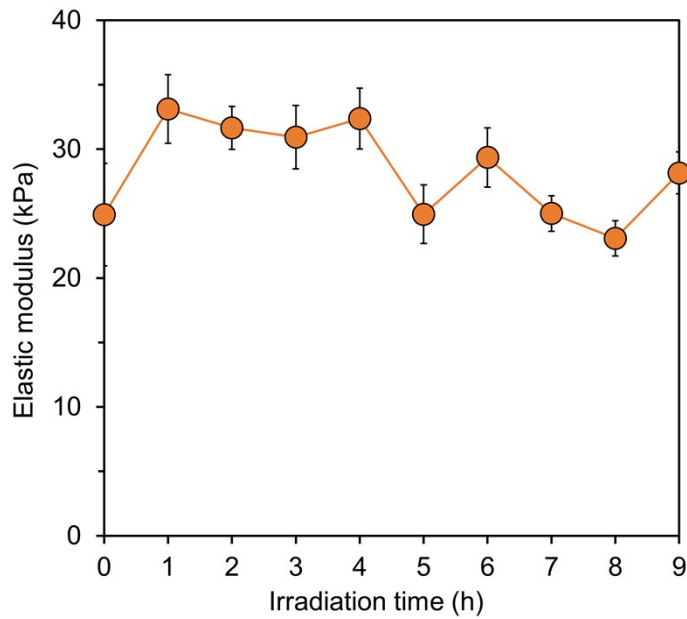


Fig. S1. Change in elastic modulus of g-C₃N₄/Alg beads under visible light irradiation.

Table S2. Law data of the change in elastic modulus of g-C₃N₄/Alg beads under visible light irradiation.

Irradiation time	Elastic modulus	Standard deviation	Standard error
0	24.9271981	8.891465	3.97638411
1	33.11307109	8.416879	2.661650899
2	31.64961679	5.294959	1.674413068
3	30.93135632	7.788527	2.462948519
4	32.37571681	7.488759	2.368153416
5	24.95205858	7.177919	2.269857393
6	29.35887487	7.281164	2.302506251
7	25.01293693	4.363725	1.379930988
8	23.07607978	4.327327	1.368420803
9	28.15718441	5.120694	1.619305524