Supplementary materials

Synthesis of Multiple Emission Carbon Dots from Dihydroxybenzoic Acid via Decarboxylation Process

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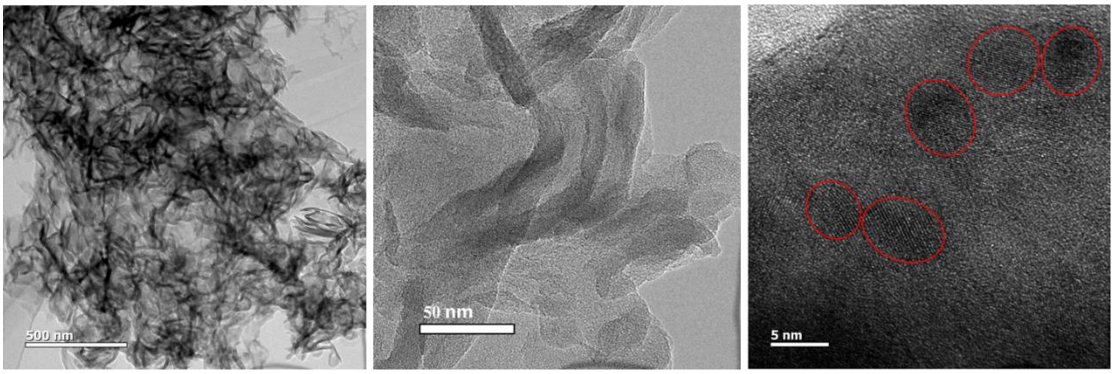

Figure S1. Representative TEM image of CDs@C_3N_4 composite photocatalyst under the different scales.

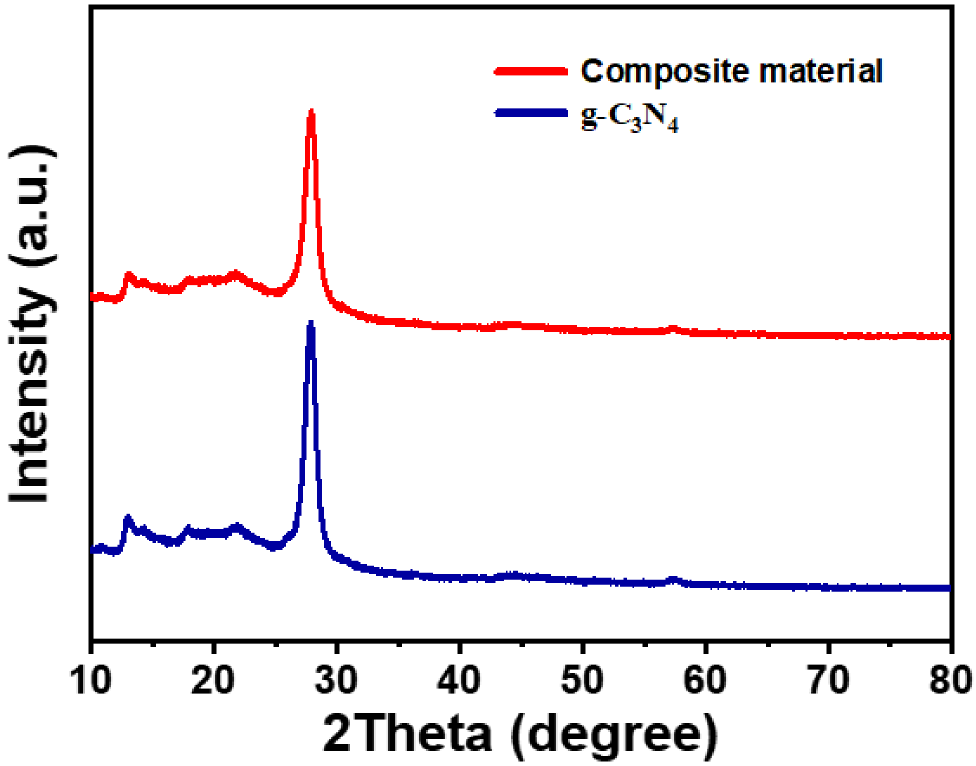

Figure S2. XRD pattern of pure C_3N_4 and CDs@C_3N_4 composite material.

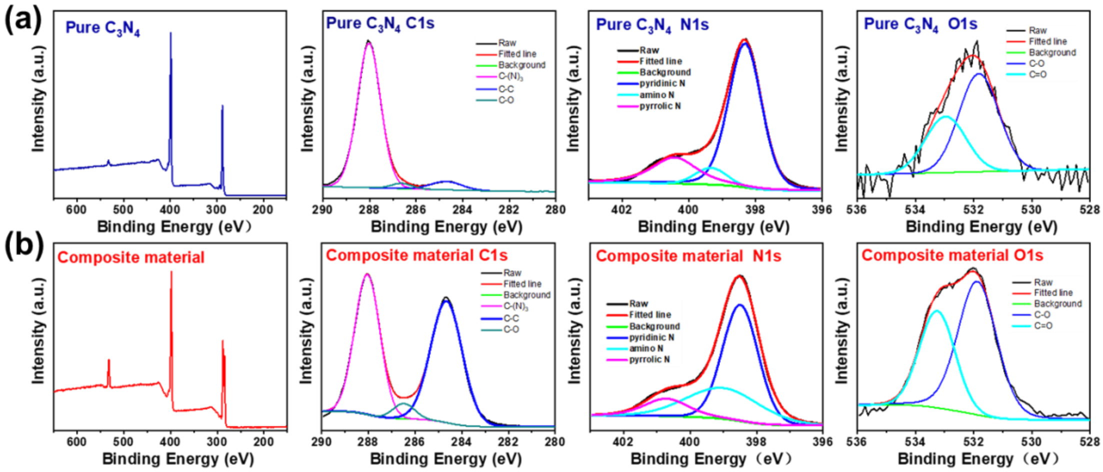

Figure S3. XPS survey spectrum of the **(a)** pure C_3N_4, and **(b)** composite material

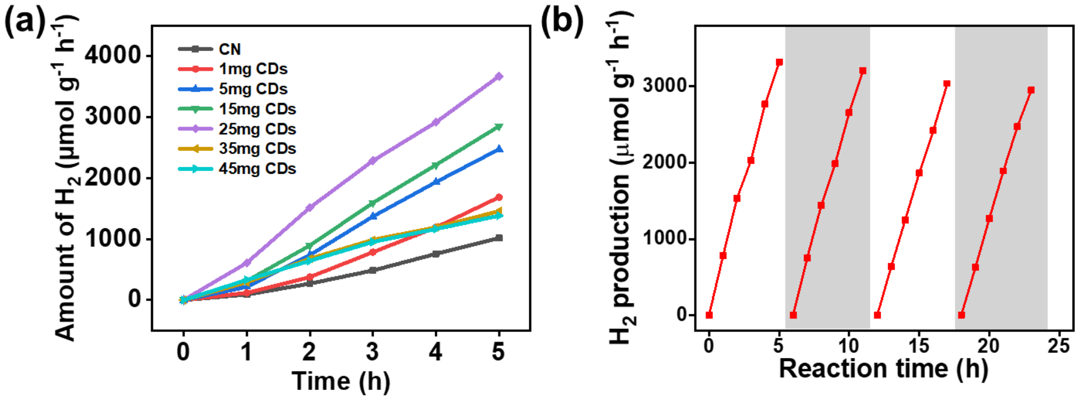

Figure S4. (a) Photocatalytic H_2 production of 2,4-CN with different content CDs, loading 1.0 wt% Pt in the 10 vol% triethanolamine (TEOA) under light irradiation (λ > 420 nm). **(b)** the stability experiment of the best composite material

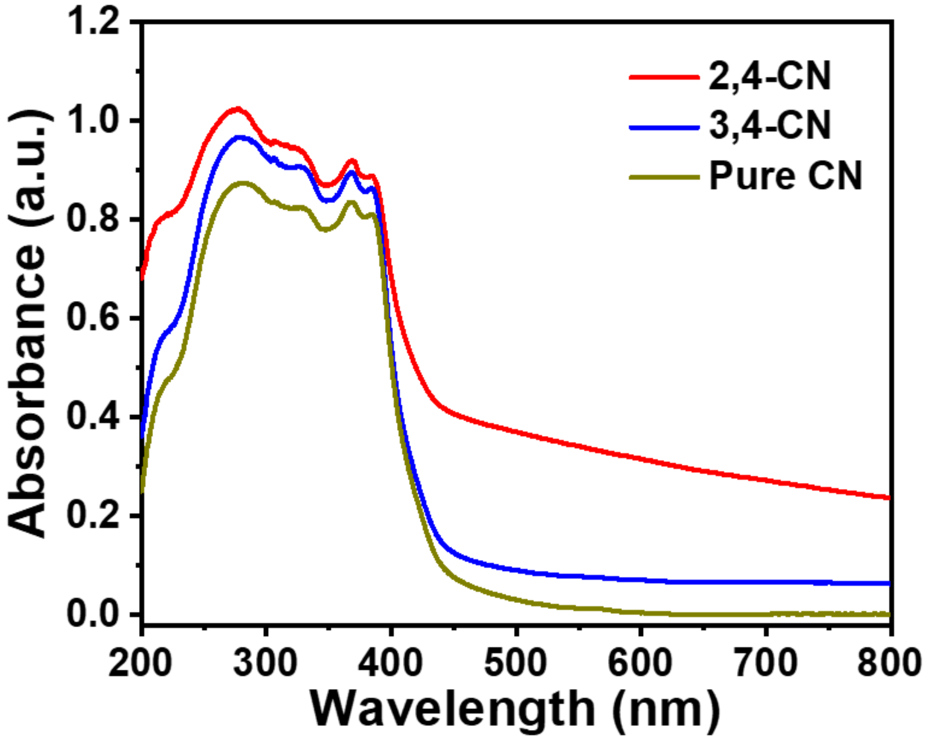

Figure S5. DRS UV-vis spectra of pure CN, 2,4- and 3,4-CN.

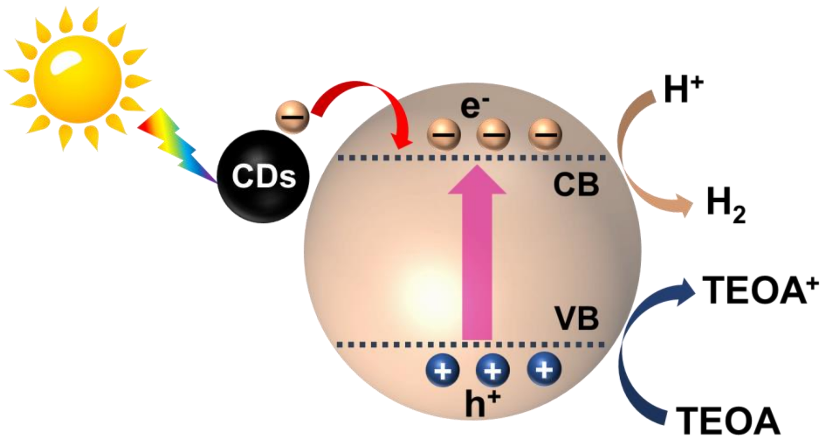

Figure S6. The schematic diagram of the composite photocatalytic hydrogen generation mechanism

Table S1. The photocatalysis hydrogen production efficiency comparative table of CDs composition

Composite /heterojunction	Method of synthesis	Hydrogen production efficiency	Light source	References
CNNS/CQDs	Solvothermal method	116.1 μmol h^{-1}, 3 times higher than pure CNN	300 W Xe arc lamp	[1]
g-C_3N_4/TiO_2/ CQDs/Au	Solvothermal method	5.69 mmol g^{-1} h^{-1}, 6.2 times higher than pure g-C_3N_4	500 W Xe lamp	[2]
ZnO/C_3N_4 QDs	Dip-coating method	2.29 times higher than pure ZnO		[3]
OH–CQDs/CNF-X	Solvothermal approach	357.98 μmol g^{-1}	300 W Xe lamp	[4]
CQD/CdS	hydrothermal and stirring	~309 mmol g^{-1} h^{-1}	visible light	[5]
CD-C_3N_4 composite	electrochemical hydrothermal	~8.4 mmol h^{-1}	300 W Xe lamp	[6]
CQD/HCN Nanocomposites	furnace (500 °C)	382 μmol g^{-1} h^{-1}	500 W xenon arc lamp	[7]
S, N-CD/g-C_3N_4 composite	Hydrothermal Solvothermal	832 μmol g^{-1} h^{-1}	300 W Xe lamp	[8]
CQDs/2D g-C_3N_4	Hydrothermal	183 μmol h^{-1}; 48.1 μmol $h-1$	UV: 365 nm; Vis: 420 nm 3 W	[9]
CQDs/2D TiO_2	Hydrothermal	79.3 μmol g^{-1} h^{-1}	500 W Hg lamp, λ not specified	[10]
CQDs/2D g-C_3N_4/2D TiO_2	Oven drying	6.497 μmol g^{-1} h^{-1}	Vis: >400, 300 W Xe lamp	[11]
2,4-CDs@C_3N_4	homogeneous thermal pyrolysis	733.8μmol g^{-1} h^{-1}, 3.6 times higher than pure CN	300 W Xe lamp	Our work

References

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