Supporting Information

Facile Synthesis of Porous C-Doped g-C_3N_4: Fast Charge Separation and Enhanced Photocatalytic Hydrogen Evolution

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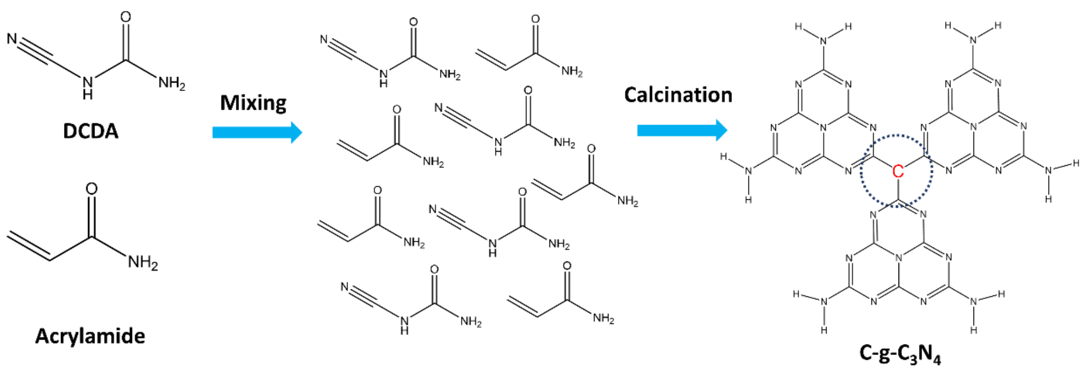

Fig. S1. The possible polymerization process to generate C-g-C_3N_4.

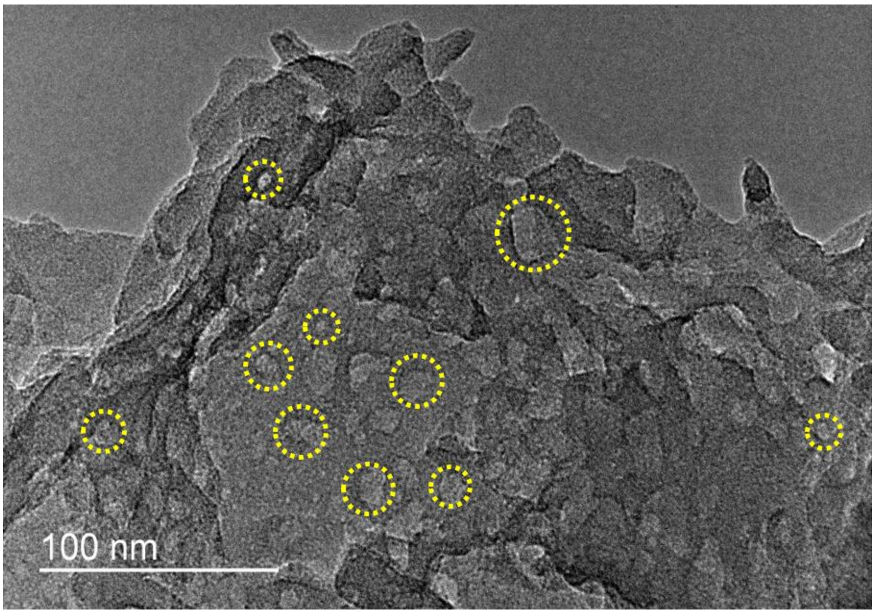

Fig. S2. The enlarged TEM images of CDCN-20.

From the enlarged TEM images, we can surely observe that CDCN-20 show porous and thinner nanosheet structure by adding the acrylamide as gas bubble.

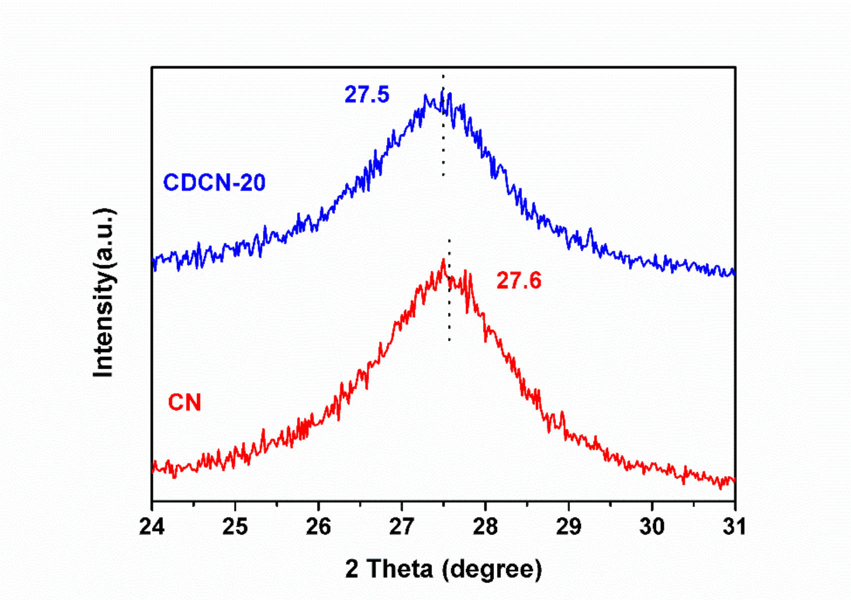

Fig. S3. The (0 0 2) peak of XRD patterns of CN and CDCN-20.

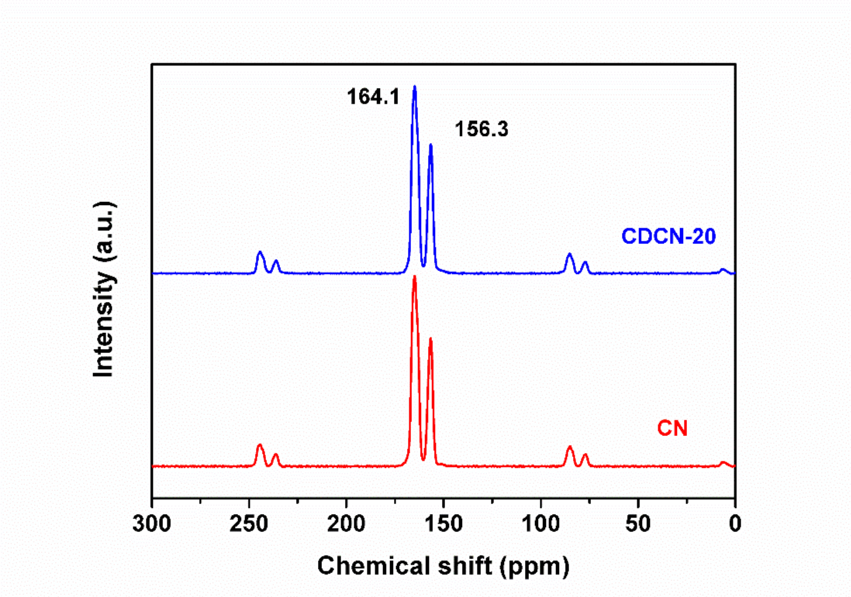

Fig. S4. The solid state ^{13}C CP MAS NMR spectra of CN and CDCN-20.

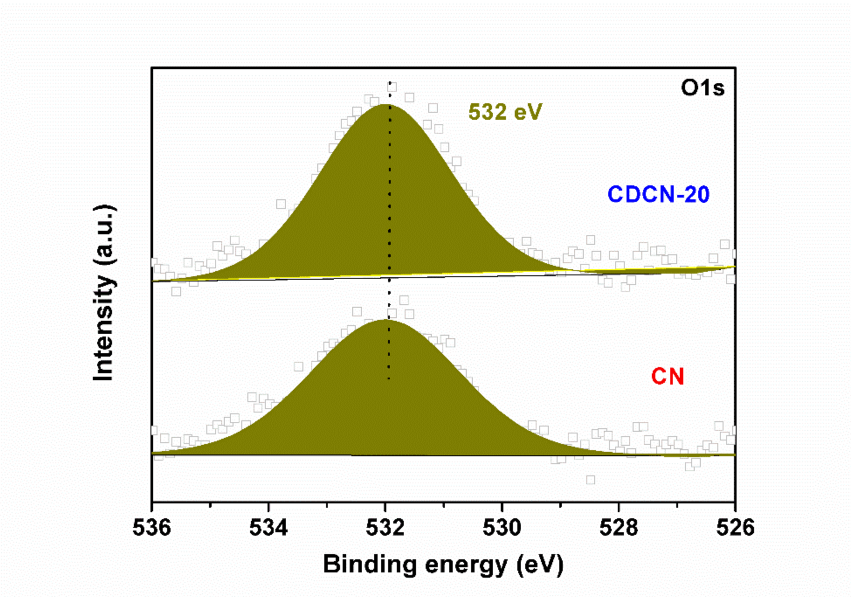

Fig. S5. High-resolution XPS spectra of O1s of CN and CDCN-20.

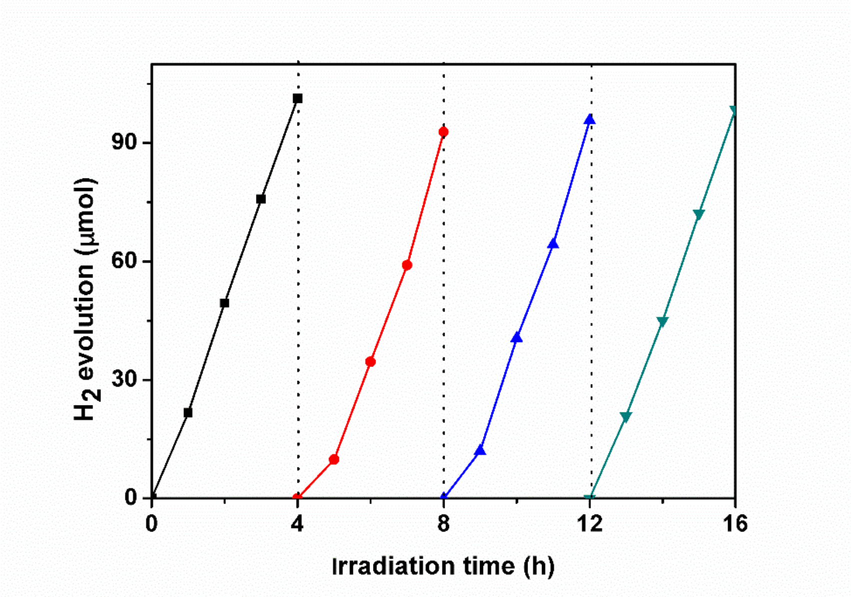

Fig. S6. long-term H_2 evolution by CDCN-20 under visible light irradiation.

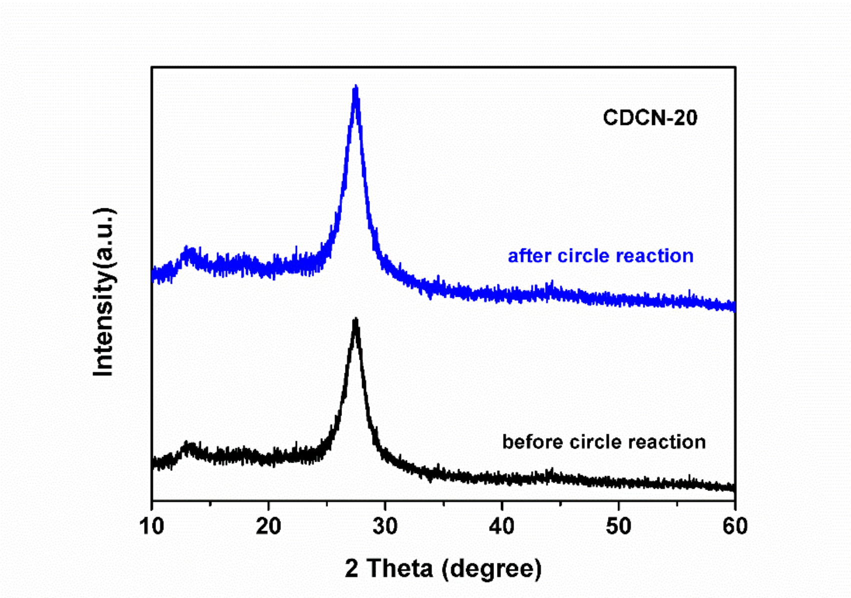

Fig. S7. XRD patterns of CDCN-20 before and after circle reaction.

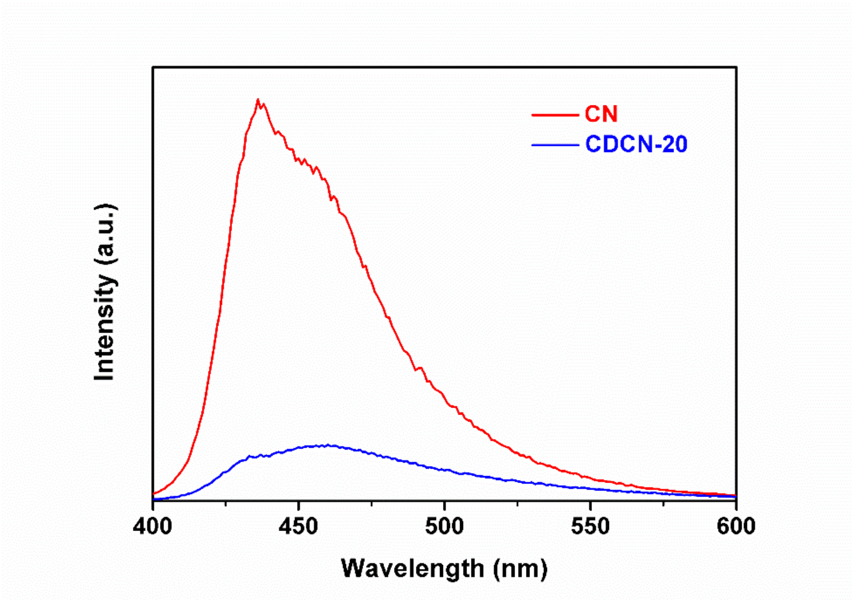

Fig. S8. Photoluminescence spectra of CN and CDCN-20.

Fig. S9. The color variation of the g-C_3N_4 based material.
Adding trace amount of acrylamide can cause the change of the product color from light yellow to dark brown.

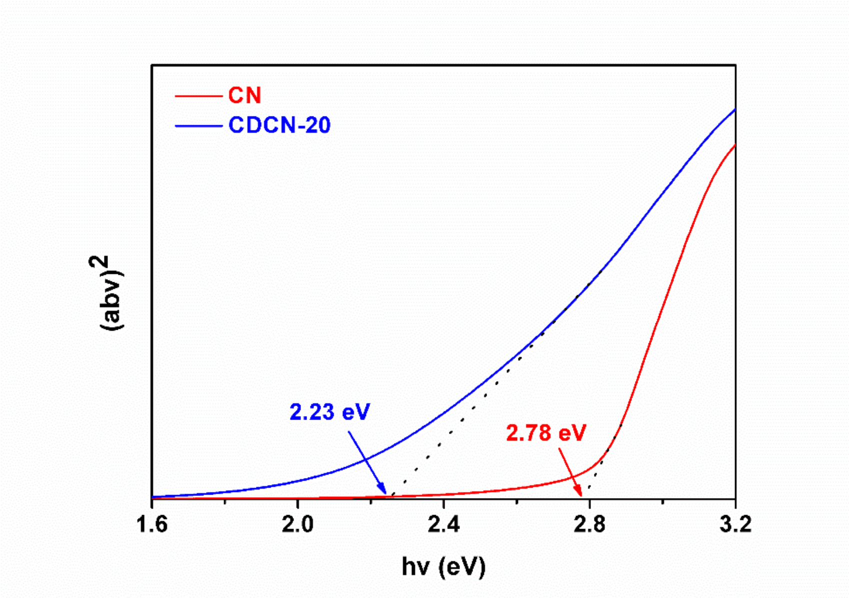

Fig. S10. Band energy level of CN and CDCN-20.

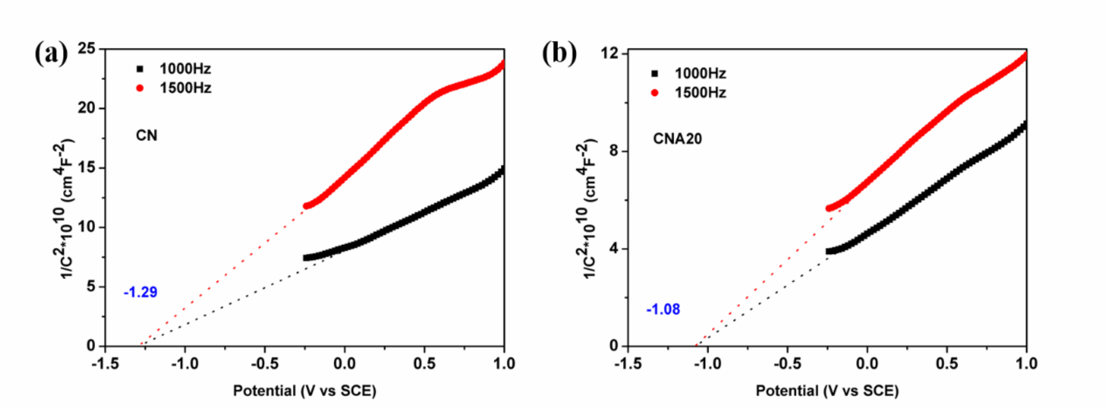

Fig. S11. Mott−Schottky plots of CN (a) and CDCN-20 (b) under different frequency 1000 Hz and 1500 Hz.

Table S1 Results of organic elemental analyses for CN and CDCN-x (x=10, 20 and 40).

sample	N/%	C/%	H/%	C/N[a]
CN	58.03	33.21	2.381	0.6677
CDCN-10	58.73	34.11	2.39	0.6776
CDCN-20	58.12	33.8	2.233	0.6785
CDCN-40	54.67	34.72	2.58	0.7409

a: mola radio

Table S2 Area ratios of the C and N atoms in different chemical states of CN and CNA20 samples.

Sample	C1s			N1s		
	Position(ev)	Assign	Ratio(at%)	Position(ev)	Assign	Ratio(at%)
CN	284.8	C-C	10.9	398.8	C-N=C	75.9
	288.1	N=C-N	89.1	400.1	N-C_3	24.1
				401.1	C-N-H	
CDCN-20	284.8	C-C	15.6	398.8	C-N=C	76.8
	288.1	N=C-N	84.4	400.1	N-C_3	23.2
				401.1	C-N-H	

Table S3 Comparison of the photocatalytic performance and synthetic approach of CDCN-20 with other C-doped photocatalysts reported recently in the literature.

Photocatalyst	Precursor	synthesis	Application	Enhanced photocatalytic activity/pristine	Ref.
CDCN-20	Dicyandiamide Acrylamide	Thermal polymerization	H_2 evolution	3.4 times	This work
C-g-C_3N_4	Melamine pretreated with absolute ethanol	Polycondensation	RhB degradation	4.47 times	[1]
5M-CF	Melamine and melamine porous resin foam	Polycondensation	NO removal	3.8 times	[2]
CCN	Glucose Melamine	Hydrothermal	4-nitropheol degradation	Enhanced	[3]
C2/g-C_3N_4	g-C_3N_4 Glucose	Hydrothermal	MB degradation	1.32 times	[4]
C2GCN	Dicyandiamide β-cyclodextrin	Thermal polymerization	H_2 evolution	5 times	[5]
C-g-C_3N_4	Melamine and cyanuricacid weredissolved in ethylene	Annealing	H_2 evolution	15 times	[6]
CCN-0.2	Melamine cyanuric acid Chitosan	Thermal polymerization	H_2 evolution	29.1 times	[7]
BTPMC g-C_3N_4	Urea Kapok fibre	Thermal condensation	BPA Degradation	Enhanced	[8]
CN-C	Urea Saccharose	Co-pyrolysis	NO removal	1.7 times	[9]

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