Supplementary Information

Figure S1. FESEM images of the bulk g-C_3N_4 structure synthesized without ethanol treatment under the same experimental conditions.

Figure S2. Brunauer-Emmett-Teller (BET) surface area of g-C_3N_4 structures synthesized with and without AA; (A) pure g-C_3N_4, (B) 2 wt% AA-g-C_3N_4, (C) 5 wt% AA-g-C_3N_4, (D) 10 wt% AA-g-C_3N_4, (E) 16 wt% AA-g-C_3N_4, and (F) 20 wt% AA-g-C_3N_4.

Figure S3. X-ray photoelectron spectroscopy **(**XPS) analysis data for the g-C_3N_4 structure without AA incorporation; survey (A), C 1s (B) and N 1s (C).

Figure S4. XPS analysis data for the g-C_3N_4 structure with 16 wt% AA incorporation; survey (A), C 1s (B) and N 1s (C).

Figure S5. Recyclability of g-C_3N_4 structure with 16 wt% AA (CN16) for H_2 evolution under simulated sunlight irradiation.

Figure S6. Room temperature photoluminescence spectra of CN0, CN16 and AA structures.

Table S1. Summary of BET values for the pristine and AA treated g-C_3N_4 structures.

Table S2. Quantitative XPS analysis of pure and AA-g-C_3N_4 structures.

Table S3. Comparison of H_2 evolution from doped g-C_3N_4-based hybrid structures between the literature and the present work.

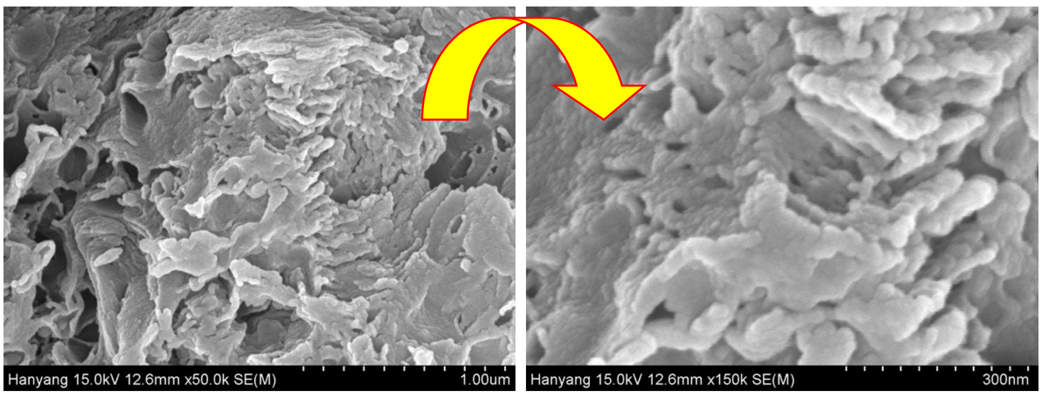

Hanyang 15.0kV 12.6mm x50.0k SE(M)
1.00um
Hanyang 15.0kV 12.6mm x150k SE(M)
300nm

Figure S1

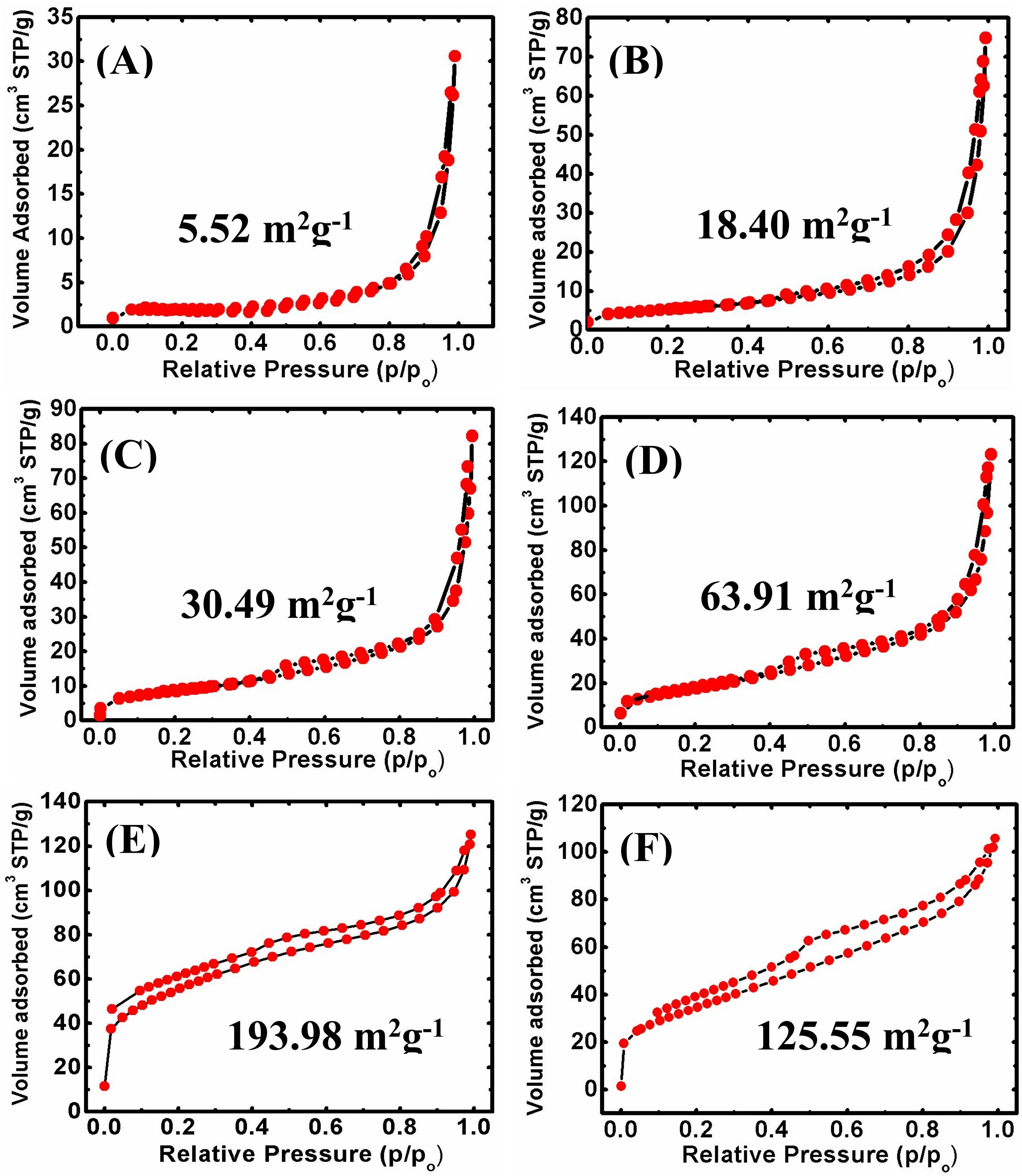


Figure S2 (A to F)

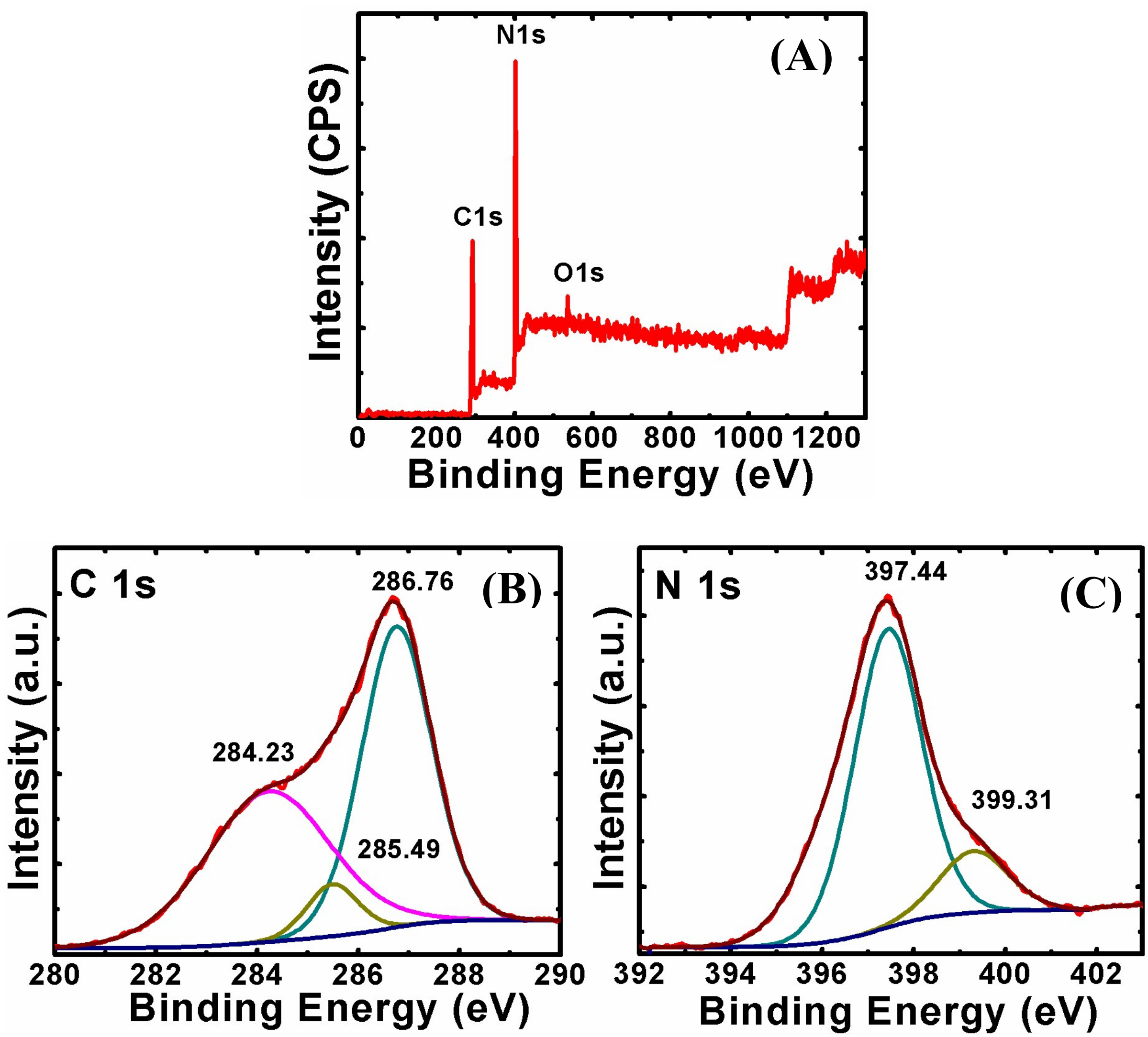


Figure S3 (A to C)

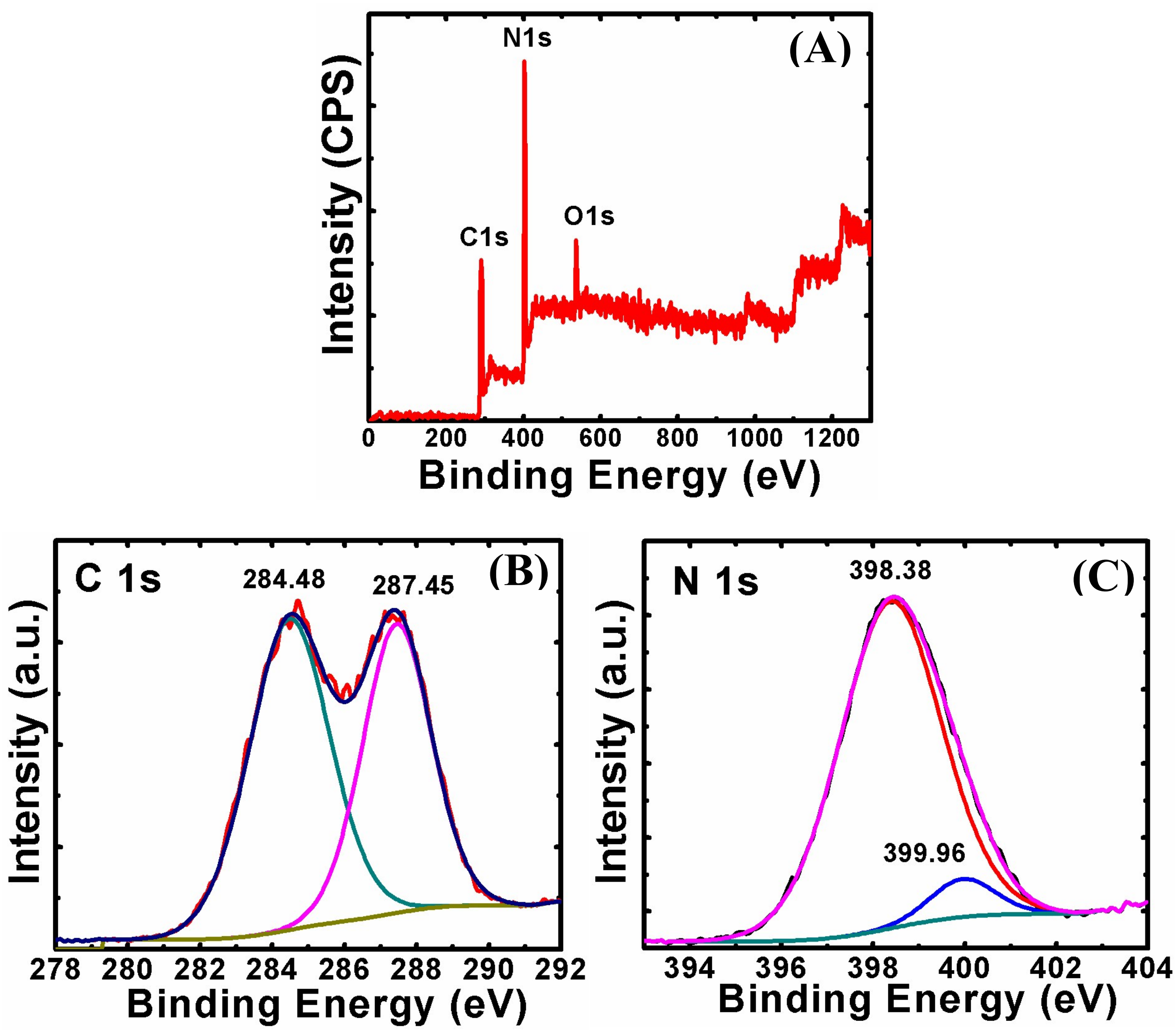
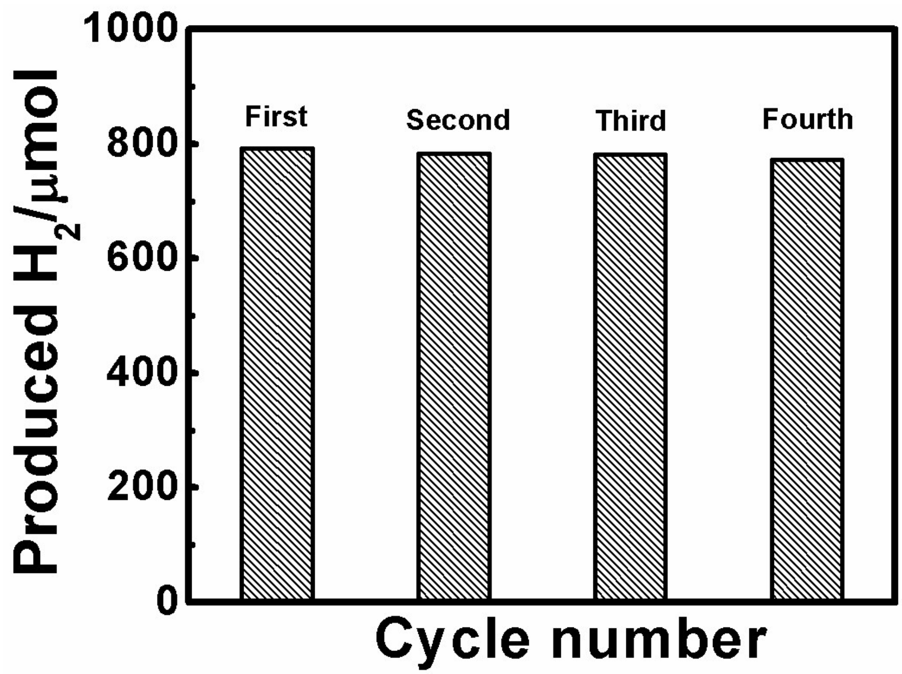


Figure S4 (A to C)



1000
800
600
400
200
0
Produced H2/μmol
First
Second
Third
Fourth
Cycle number

Figure S5

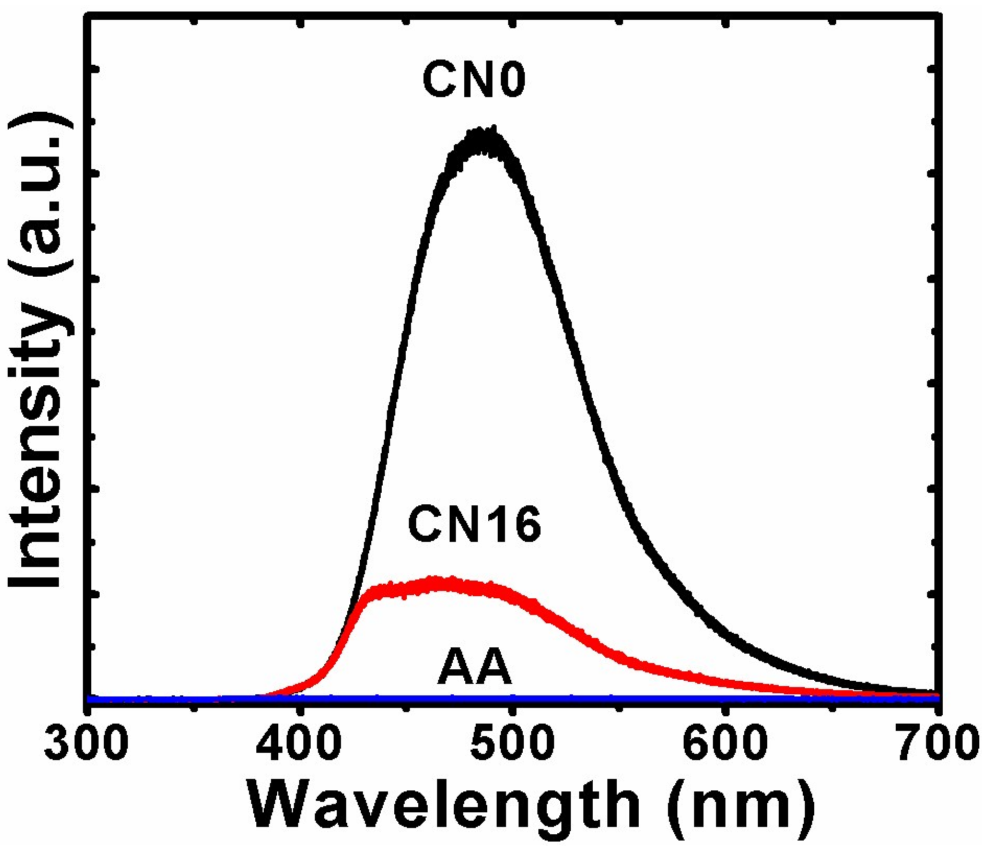


Figure S6

Sr. No.	Sample Name	Surface Area (m^2g^{-1})
1	CN0	5.52
2	CN2	18.40
3	CN5	30.49
4	CN10	63.91
5	CN16	193.98
6	CN20	125.55

Table TS1

Sample details	Carbon (%)	Nitrogen (%)	Oxygen (%)	C/N ratio
CN0	46.24	62.49	2.65	0.73
CN2	44.06	53.9	2.03	0.81
CN5	43.91	53.79	2.3	0.81
CN10	44.95	52.62	2.42	0.85
CN16	44.31	53.94	1.76	0.83
CN20	50.72	45.21	4.08	1.12

Table TS2

Photocatalyst	Light Source	Catalyst powder (mg)	Sacrificial agent	Reaction Solution (mL)	Hydrogen evolution (μmol.h^{-1})	Ref.
Porous defect-modified $g\text{-}C_3N_4$	300W Xe Lamp (λ > 420 nm)	10	TEOA	100	2092	S1
Bimodal porous $g\text{-}C_3N_4$	300W Xe Lamp (λ > 400 nm)	200	TEOA	200	1900	S2
Oxygen doped $g\text{-}C_3N_4$	300W Xe Lamp (λ > 420 nm)	30	TEOA	50	1050.3	S3
Carbon rich $g\text{-}C_3N_4$	300W Xe Lamp (λ > 420 nm)	20	TEOA	35	125.1	S4
Ultrathin $g\text{-}C_3N_4$ nanosheets	150 W Xe lamp (λ > 420 nm)	10	TEOA	10	5498.24	S5
Amorphous carbon/$g\text{-}C_3N_4$	350 W Xe lamp (λ > 420 nm)	50	TEOA	80	212.8	S6
$g\text{-}C_3N_4$ nanobelts	300W Xe Lamp (λ > 400 nm)	20	TEOA	80	1360	S7
Carbon quantum dot modified g-C_3N_4	500 W Xe lamp (λ > 420 nm)	15	TEOA	25	382	S8
Porous P-doped $g\text{-}C_3N_4$	300W Xe Lamp (λ > 400 nm)	50	TEOA	100	1596	S9
Oxygen substituted $g\text{-}C_3N_4$	300 W Xe lamp (λ > 420 nm)	50	TEOA	100	1062.4	S10
Bulk $g\text{-}C_3N_4$	300 W Xe lamp (λ > 400 nm)	2	TEOA	40	31	Present work
16% AA mediated $g\text{-}C_3N_4$					422	

Table TS3

Supporting References

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