Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting information

One-Step Large-Scale Drastically Active g-C_3N_4 Nanosheets for Efficient Sunlight-Driven Photocatalytic Hydrogen Production

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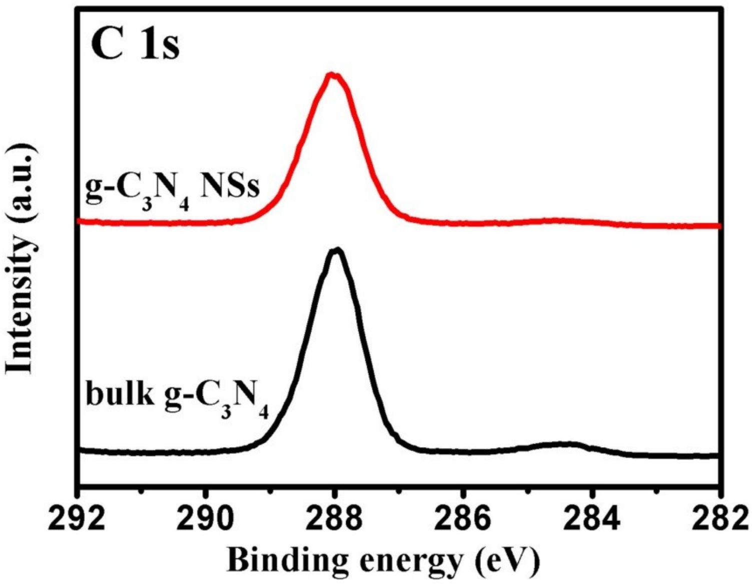

Fig. S1. The C 1s XPS spectra of bulk g-C_3N_4 and g-C_3N_4 NSs. The peak of C 1s at 284.6 eV arises from the adventitious carbon in the samples.

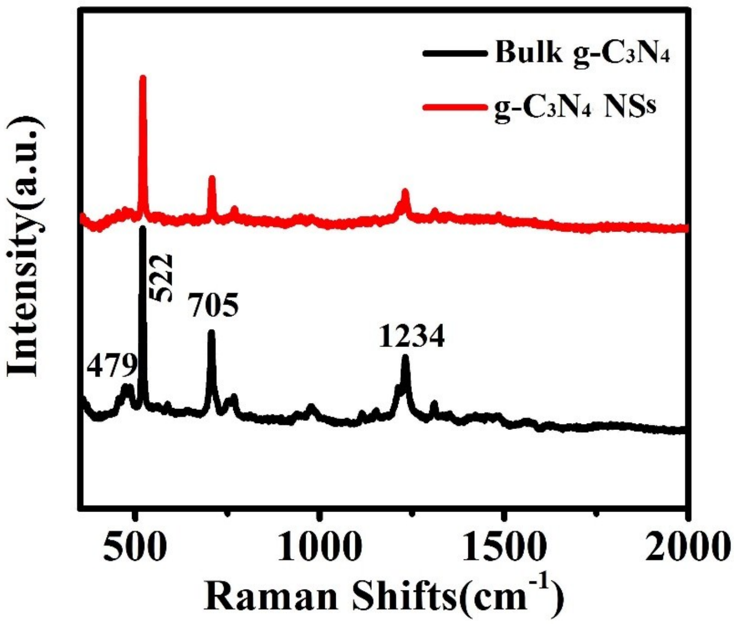

Fig. S2 Raman spectra of bulk g-C_3N_4 and g-C_3N_4 NSs ,conducted at 785nm Laser using silicon glass as a substrate to avoid florescence.

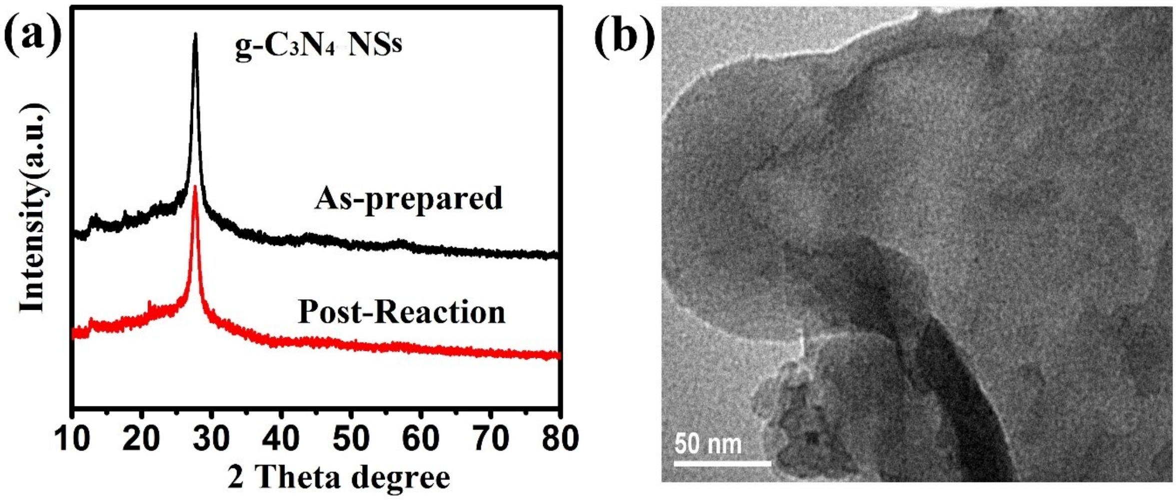

Fig. S3. (a) XRD patterns of as-prepared and post-reaction g-C_3N_4 NSs photocatalysts and (b) TEM image after four successive cycles of H_2 Production. There is no obvious difference noticed in crystal structure and catalyst has retained the sheet like morphology, demonstrating the good stability.

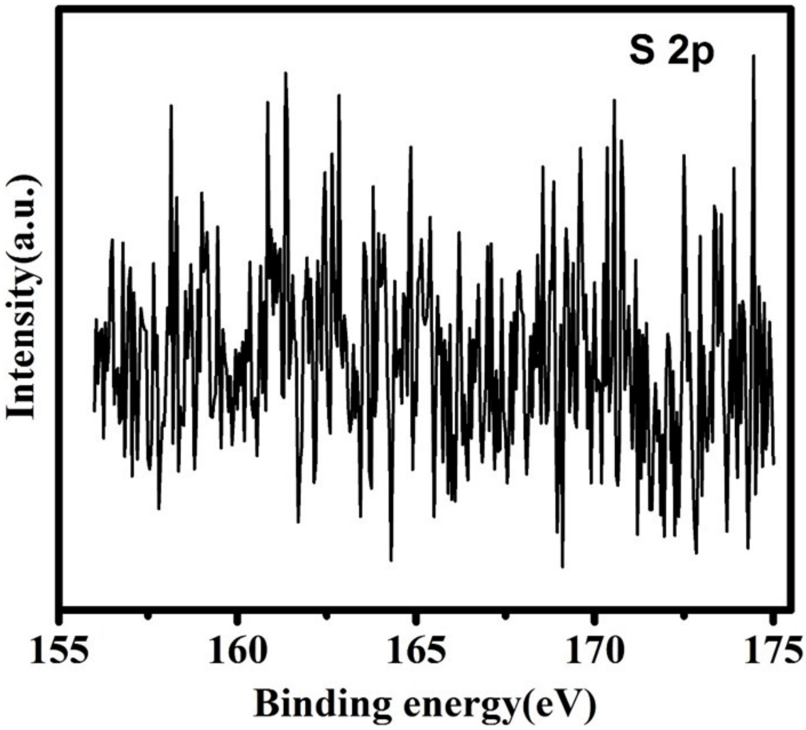

Fig. S4 S 2p XPS spectrum of ammonium sulphate mediated g-C_3N_4 NSs.

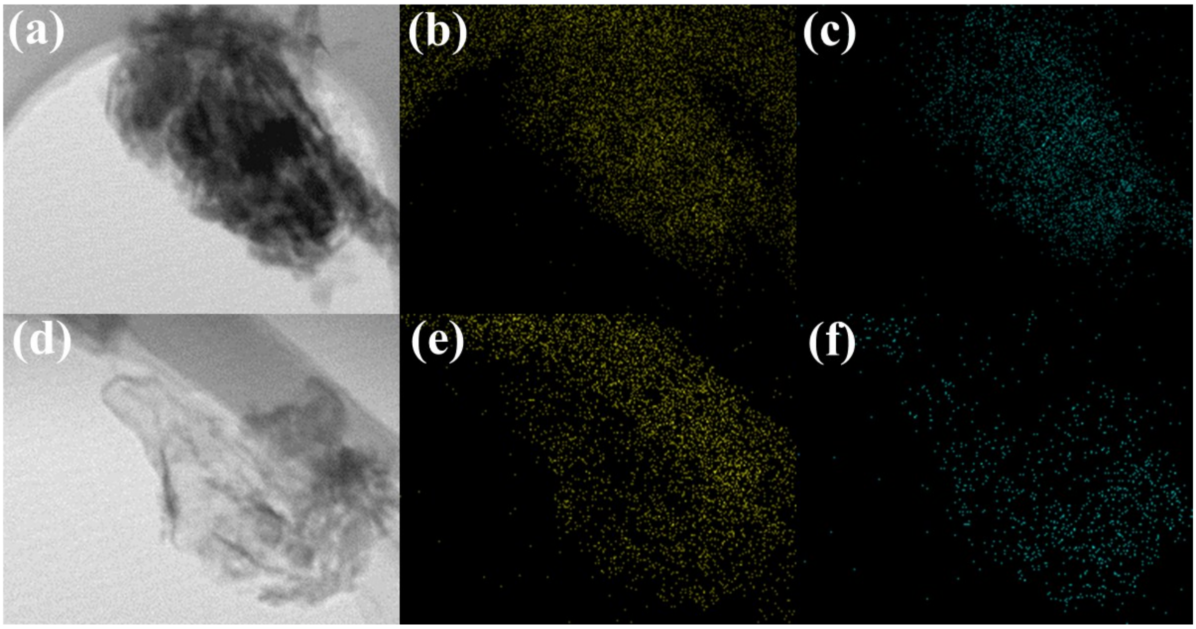

Fig. S5 TEM image (a) of Bulk g-C_3N_4 and corresponding TEM EDX mapping of carbon (b), nitrogen (c), TEM image (d) of g-C_3N_4 NSs and corresponding TEM EDX mapping of carbon (e), nitrogen (f).

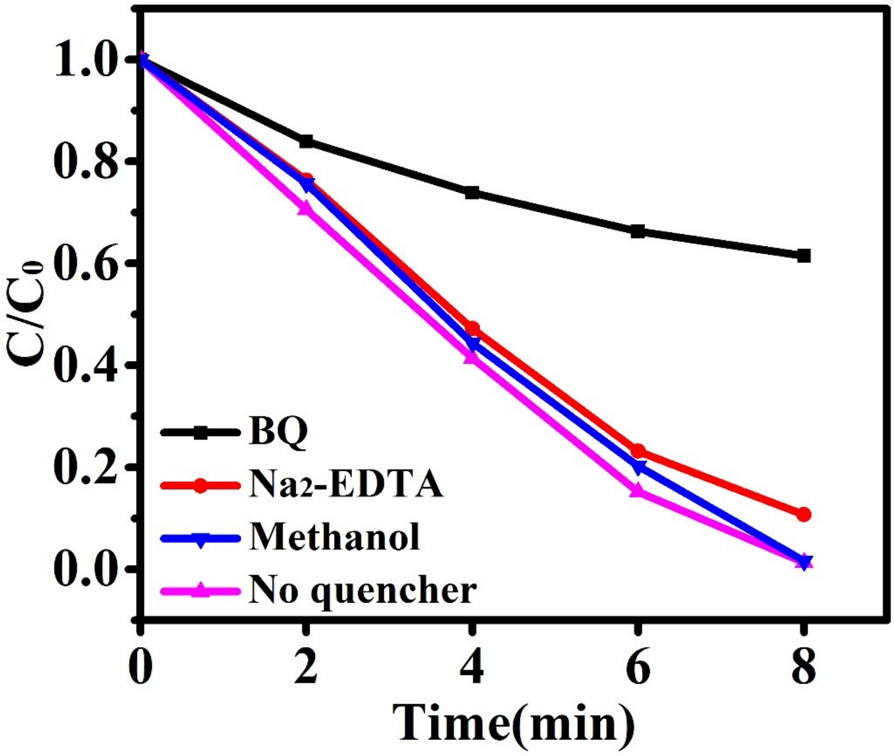

Fig. S6 Plots of photogenerated carriers trapped for g-C_3N_4 Ss which show that the superoxide radical ($\cdot O_2^-$) generated by reduction of O_2 play a major role in photocatalytic degradation of RhB pollutant.

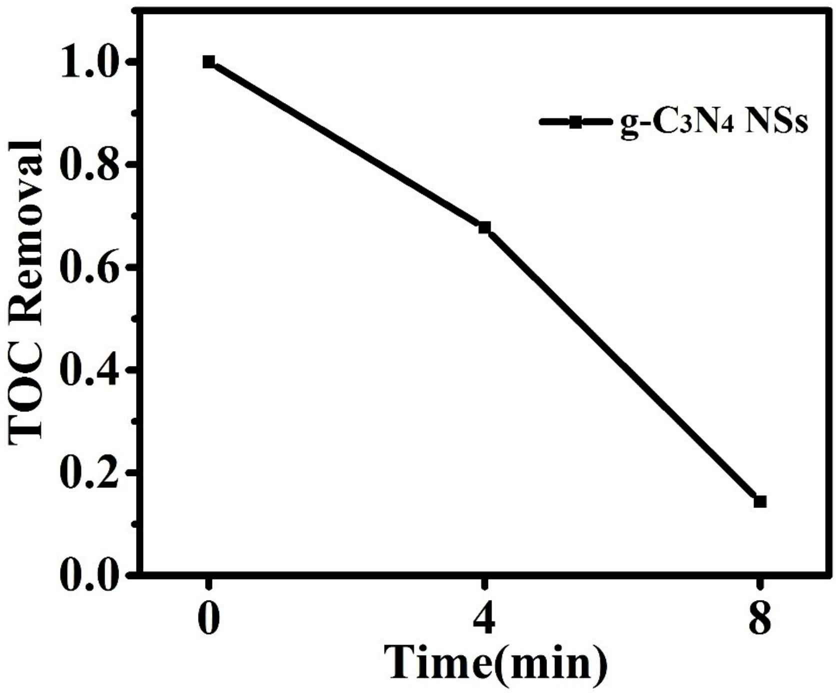

Fig. S7 TOC removal of RhB in the presence of g-C_3N_4 NSs photocatalyst under simulated solar light irradiation for 8 min which showed majority portion of the RhB has been mineralized by photocatalyst and converted into CO_2.

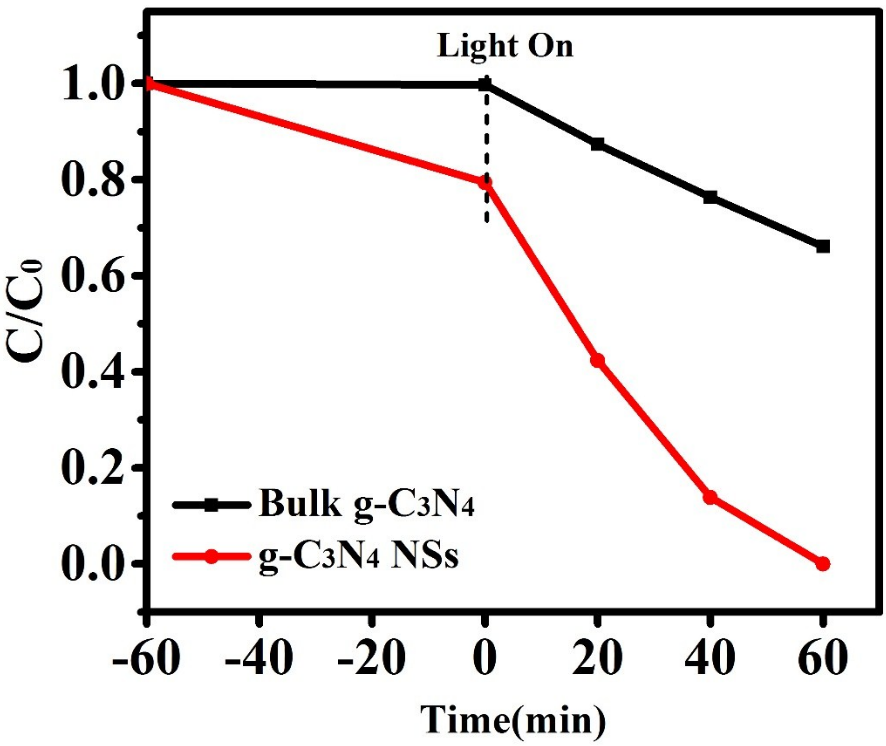

Fig. S8 Simulated solar light photodegradation of phenol

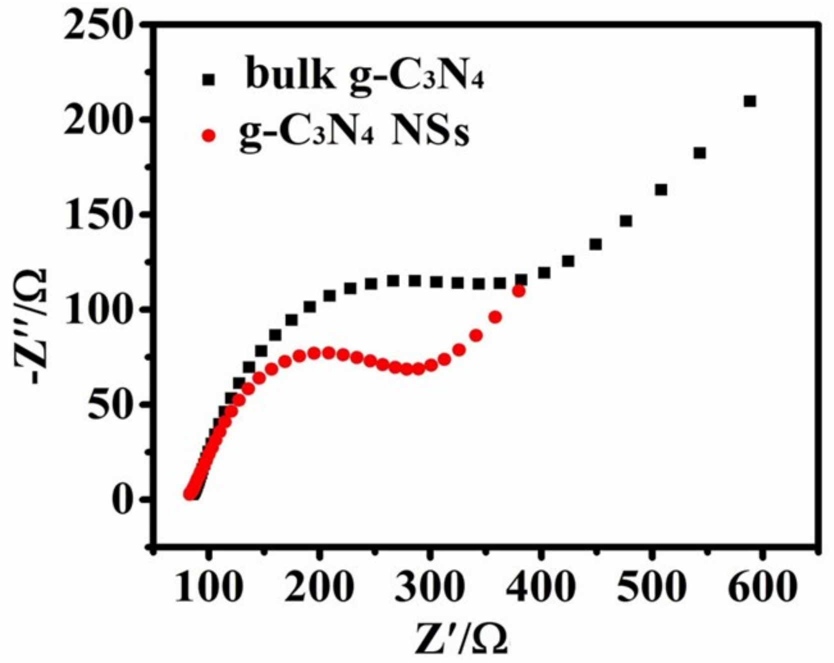

Fig. S9 EIS Nyquist plots of g-C_3N_4 NSs and bulk g-C_3N_4 under AM 1.5G irradiation.

Table S1. Elemental analysis of bulk g-C_3N_4 and g-C_3N_4 NSs.

Samples	C wt.%	N wt.%	O wt.%	C/N
Bulk g-C_3N_4	35.73	62.5	1.65	0.666
g-C_3N_4 NSs	36.17	61.86	1.83	0.682

Table S2. The quantum efficiency of g-C_3N_4 NSs under irradiation of different wavelength monochromatic light.

Wavelength	365 nm	420 nm	475 nm	525 nm	575 nm
Φ	20.10 %	3.30 %	0.58 %	0.31%	0.15 %