Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Electronic Supplementary Information

Dual role of g-C_3N_4/carbon intra Schottky junction in charge carrier generation and separation for efficient solar H_2 production.

*A. R. Mahammed Shaheer [a], P. Karthik [a], G. Karthik [b], M. V. Shankar [c] and B. Neppolian [a]**

[a] SRM Research Institute and Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur, Chennai - 603203, Tamil Nadu, India.

[b] Department of Nuclear Physics, University of Madras, Chennai – 600024, Tamil Nadu, India.

[c] Nanocatalysis and Solar Fuels Research Laboratory, Department of Materials Science and Nanotechnology, Yogi Vemana University, Kadapa - 516005, Andhra Pradesh, India.

*neppolian.b@res.srmuniv.ac.in

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Section S1. Solar to hydrogen (STH) efficiency calculation

The solar to hydrogen efficiency can be calculated by following mathematical expression

$$STH(\%) = \frac{Energy\ of\ generated\ H_2}{Solar\ energy\ irradiating\ the\ solution} \times 100 = \frac{E_{H_2}}{E_{Solar}} \times 100$$

$$E_{H_2} = (H_2 in mol/sec) \times 232 kJ/mol$$

$$E_{Solar} = P \times S \times t$$

Where, P= Irradiated solar energy in W/m^2

S= Area of irradiation in m^2

t= Irradiated time in sec

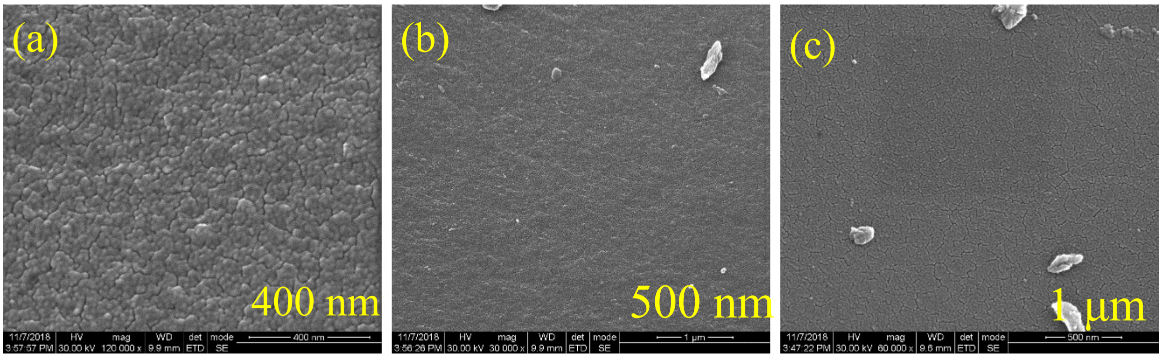

Figure S1. FE-SEM images of C100.

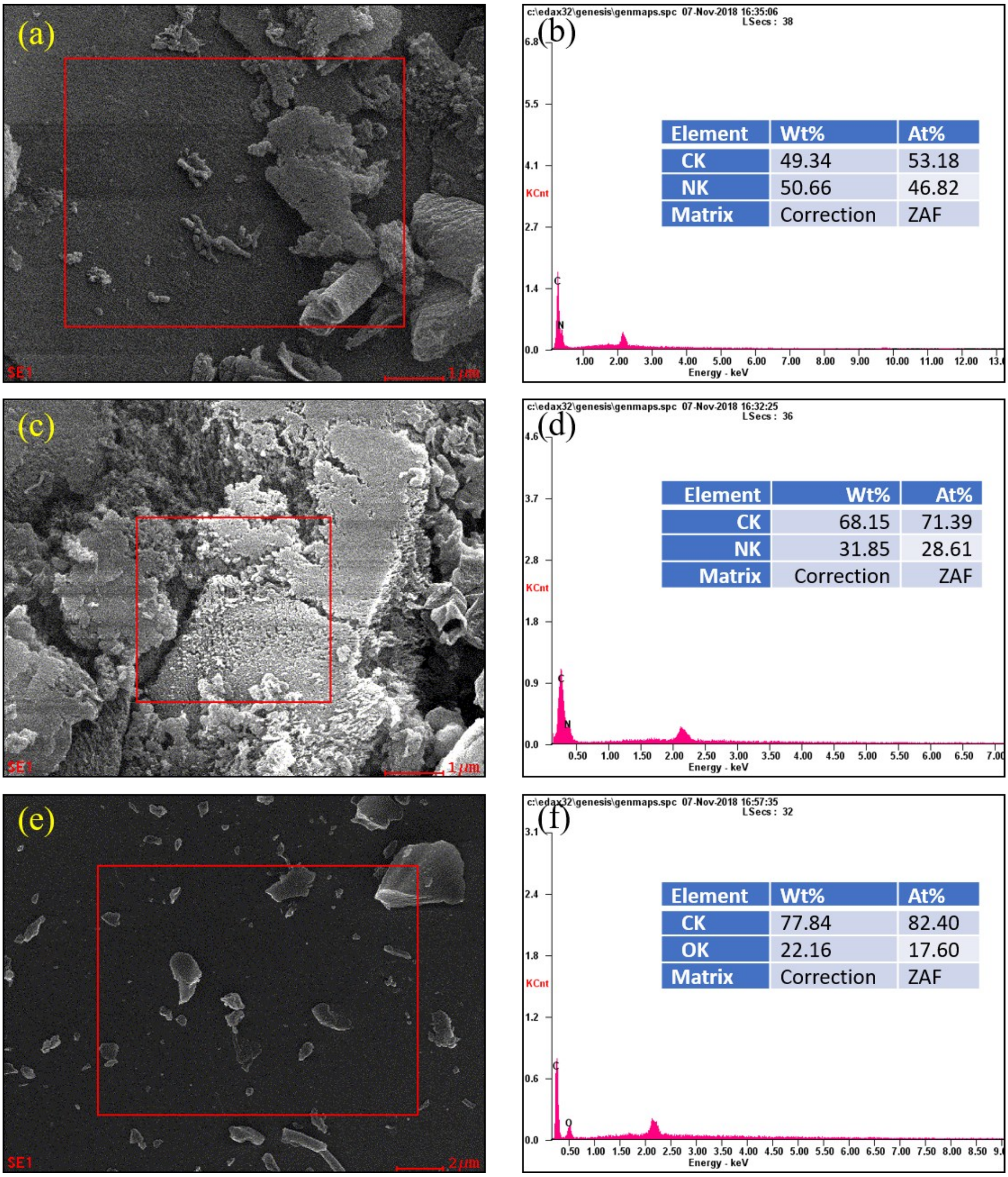

Figure S2. SEM and EDAX of (a) and (b) g-C_3N_4, (b) and (c) C_3N_4-5C, (e) and (f) C100.

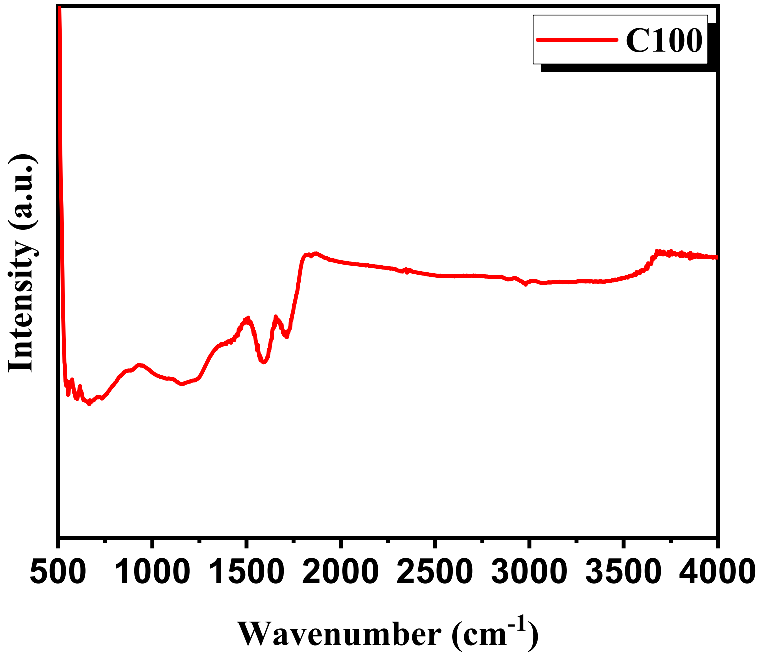

Figure S3. FTIR spectrum of C100.

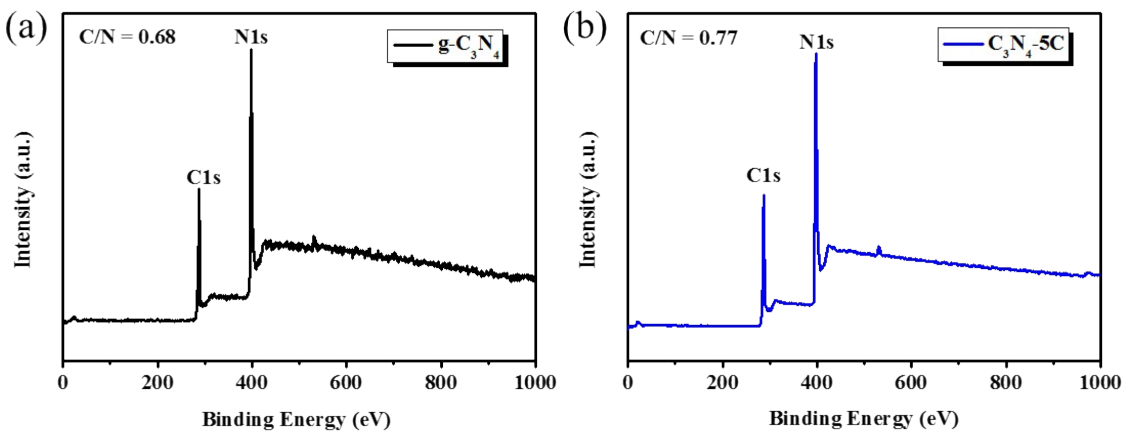

Figure S4. Wide Scan XPS of g-C_3N_4 and C_3N_4-5C.

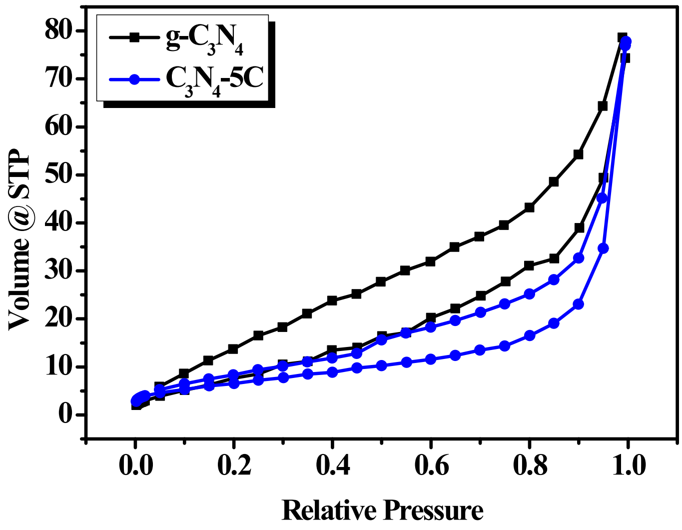

Figure S5. Nitrogen sorption isotherms of $g\text{-}C_3N_4$ and C_3N_4-5C

Table S1. Different bonding percentage of deconvoluted N1s XPS spectra of $g\text{-}C_3N_4$ and C_3N_4-5C

Sample Name	**C=N-C**	**N-(C)$_3$**	**C=N-H**
$g\text{-}C_3N_4$	0.52	0.33	0.15
C_3N_4-5C	0.48	0.41	0.11

Table S2. Life time decay data.

Sample	A1 (%)	η1 (ns)	A2 (%)	η2 (ns)	A3 (%)	η3 (ns)
C_3N_4	16.6	2.24	83	11.2	0.4	0.047
C_3N_4-5C	16.6	1.34	0.4	0.031	83	6.63

Table S3. STH (%) of prepared photocatalysts.

Catalyst Name	**STH (%)**
C_3N_4	0.015614
C_3N_4-2.5C	0.036531

C_3N_4-5C	0.102614
C_3N_4-7.5C	0.020781
C_3N_4-10C	0.007835
C100	0

Table S4. BET Specific surface area of g-C_3N_4 and C_3N_4-5C

Sample name	Surface Area (m^2/g)	Pore Volume (cm^3/g)
g-C_3N_4	26.313	0.117
C_3N_4-5C	19.545	0.115