

Supplementary Information

Unlocking the Potential of Thermally Exfoliated Ultrathin g-C₃N₄ Nanosheets: Abundant Active Sites for Enhanced Solar Photocatalysis

Suma Das^{1,2}, Swapnamoy Pramanik³, Ranjith G Nair^{2§}, Avijit Chowdhury^{1,3**}

¹Organic Electronics & Sensor Laboratory, Department of Physics, National Institute of Technology
Silchar, Assam 788010, India.

²Solar Energy Materials Research and Testing Laboratory (SMaRT Lab), Department of Physics,
National Institute of Technology Silchar, Assam 788010, India.

³Department of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for
Basic Sciences, Block JD, Sector-III, Salt Lake, Kolkata 700106, India.

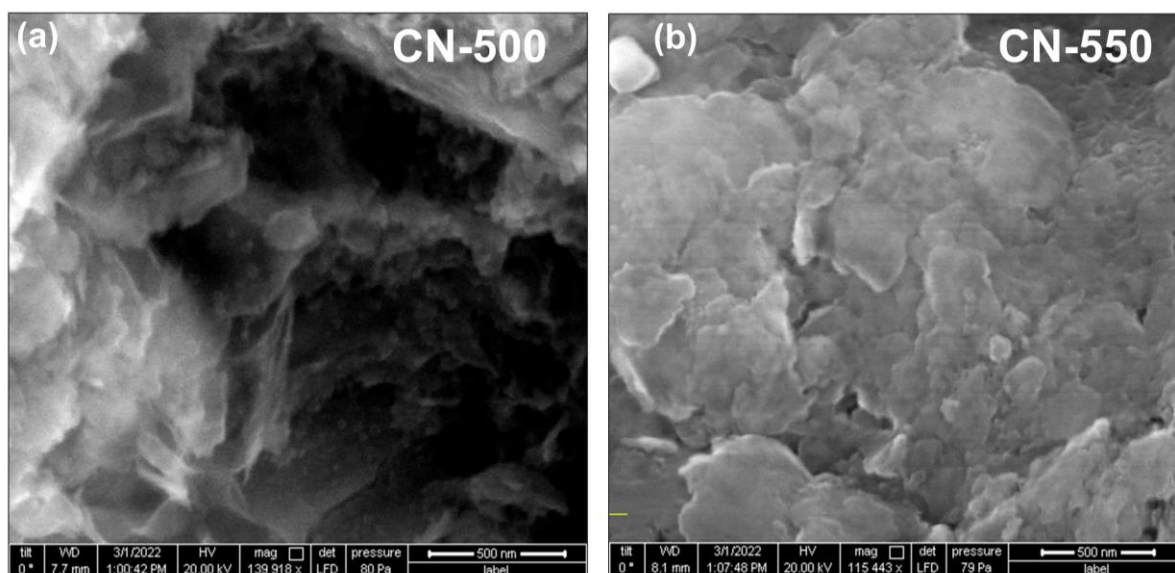


Fig. S1 SEM images of CN-500 and CN-550

Corresponding Authors

[§] Email: rgnair@phy.nits.ac.in

^{**} Email: avijitiacs@gmail.com, avijitc@bose.res.in (To whom the correspondence should be addressed)

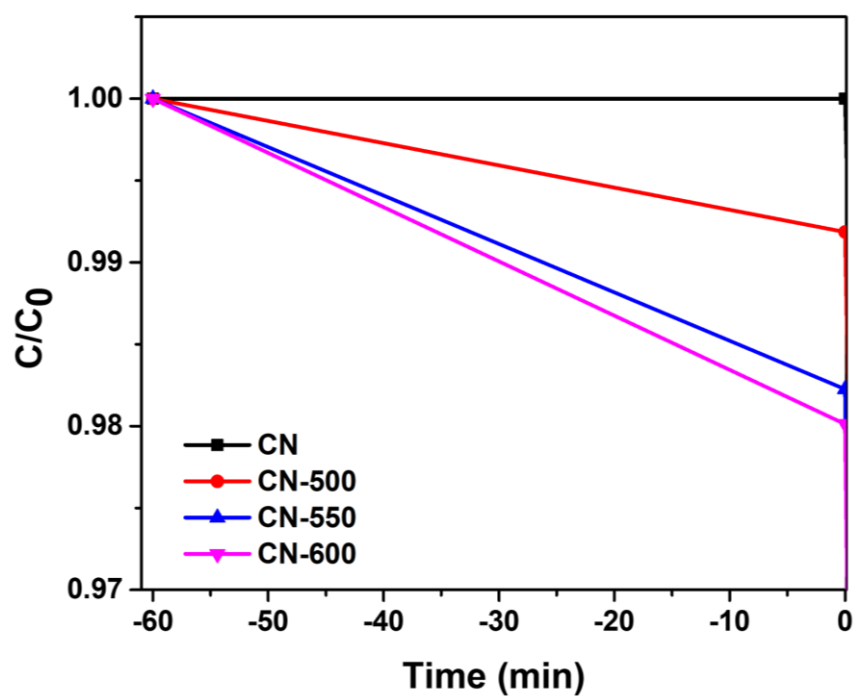


Fig. S2 The adsorption-desorption equilibrium curves for MB with CN, CN-500, CN-550 and CN-600 in dark.

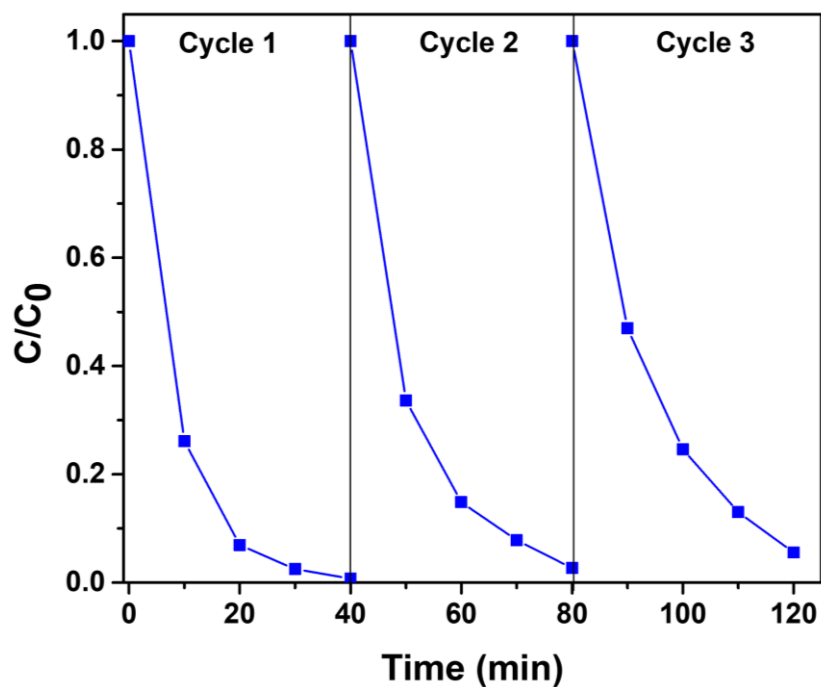


Fig. S3 stability measurement of CN-600 for photocatalytic MB dye degradation under solar light illumination.

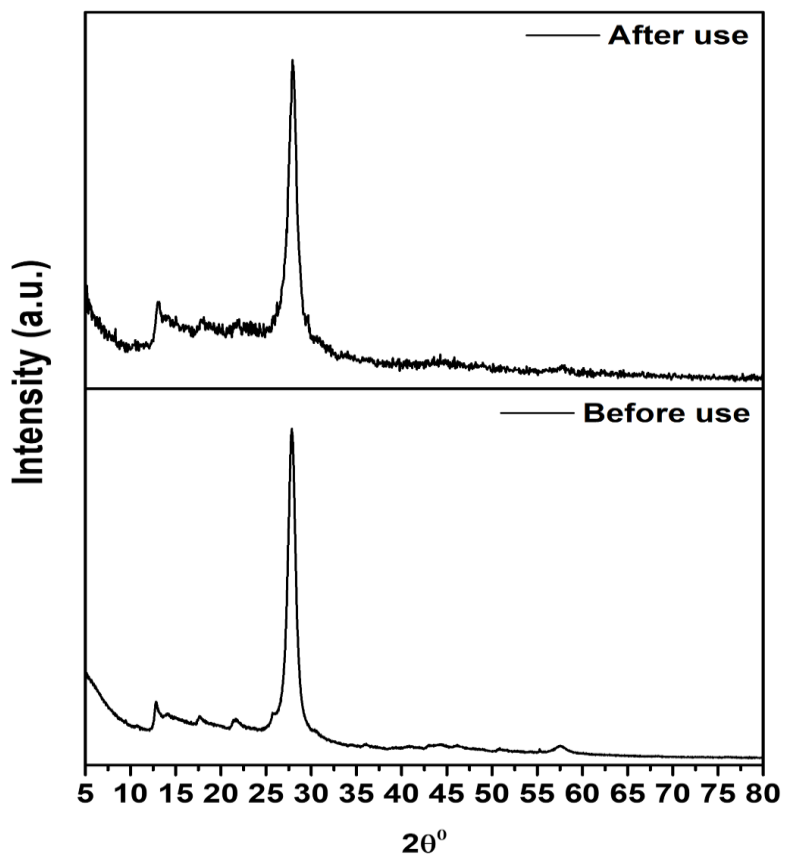


Fig. S4 XRD pattern of CN-600 before and after three cyclic test

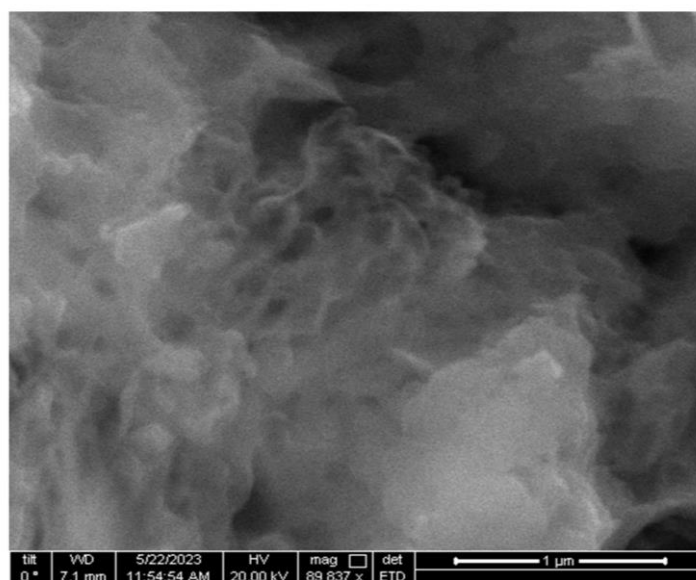


Fig. S5 FESEM image of CN-600 after three cyclic test

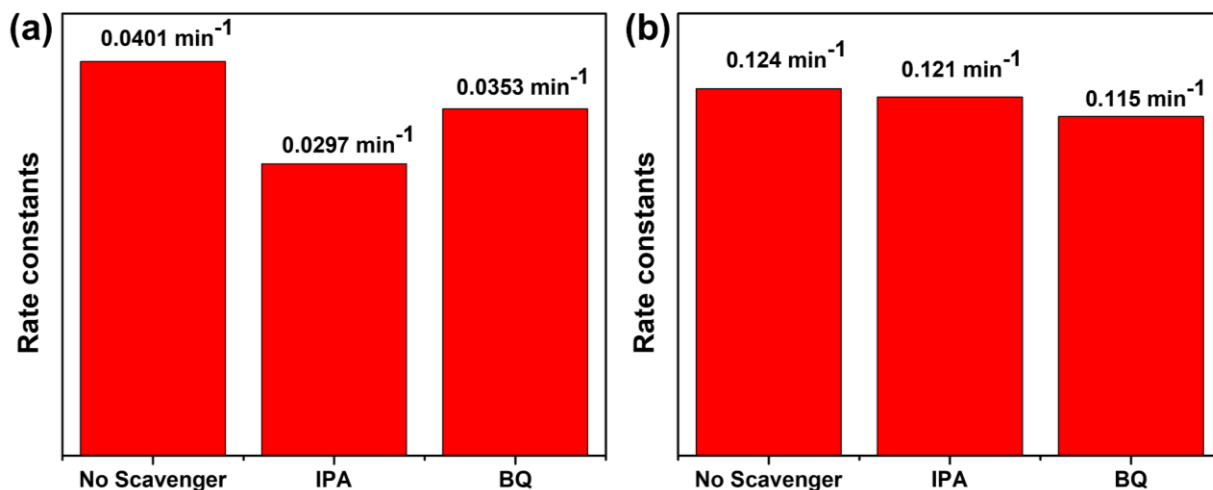


Fig. S6 Scavenger test of (a) CN and (b) CN-600 for photocatalytic MB dye degradation under solar light illumination.

Table S1: Comparative Analysis of SSA via different exfoliation technique and precursor

Exfoliation Technique	Precursor	Solvent	Temp/Conc.	Exfoliation time (h)	SSA (m ² g ⁻¹)	Ref.
Liquid	Melamine	DI water	100ml	14h	41.68	[16]
Thermal	Thiourea	--	400 ^o C /500 ^o C /550 ^o C	2h	42, 49, 151	[18]
Thermal	Melamine	IPA (10mg)	550 ^o C /5 ^o Cmin ⁻¹	2h	104.12	[19]
Thermal	Melamine	--	600 ^o C /10 ^o Cmin ⁻¹	2h	14.76	[20]
Thermal	Dicyandiamide	NH ₄ Cl (5g)	600 ^o C /3 ^o Cmin ⁻¹	2h	82.3	[21]
Thermal	Dicyandiamide	--	750 ^o C	10 min	70.2	[22]
Chemical	Melamine	HNO ₃ (65wt%)/DI water	30ml/200ml	8h/--	179.5	[23]
Chemical	Melamine	H ₂ SO ₄ /HNO ₃	20ml/20ml	5h	109.30	[24]
Chemical	Melamine	H ₂ SO ₄ (75%)/ DI water	30ml/200ml	--/2h	86.29	[25]
Chemical	Melamine	H ₂ SO ₄ (98%)/DI water	20ml/200ml	6-8h/1.5h	55.41	[26]
Chemical	Melamine	H ₂ SO ₄	5ml	24h	35.27	[27]
Chemical	Melamine	Oxalic acid (1g/30ml H ₂ O)	550 ^o C	2h	70.41	[28]
Chemical	Dicyandiamide	H ₂ SO ₄ (98%)/ DI water	10ml/--	8h/-	53.9	[29]
Chemical	Urea	HCl	150mlConc.	24h/1h	48.2	[30]
Thermal +Chemical	Urea + Thiourea	HF(6wt%)	600 ^o C/70ml	2h-4h	121.4	[32]
Thermal	Thiourea	--	600 ^o C	2h	167	This Work