

## Supplementary Information

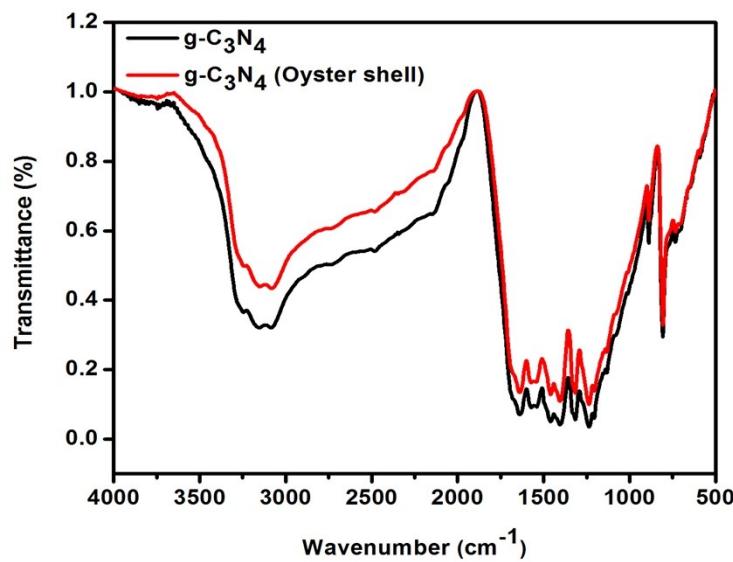
### Exfoliated metal free homojunction photocatalyst prepared by biomediated route for enhanced Hydrogen evolution and Rhodamine B degradation

Satyabadi Martha,<sup>a\*</sup> Sriram Mansingh,<sup>a</sup> K. M. Parida,<sup>a\*</sup> Arun Thirumurugan<sup>b</sup>

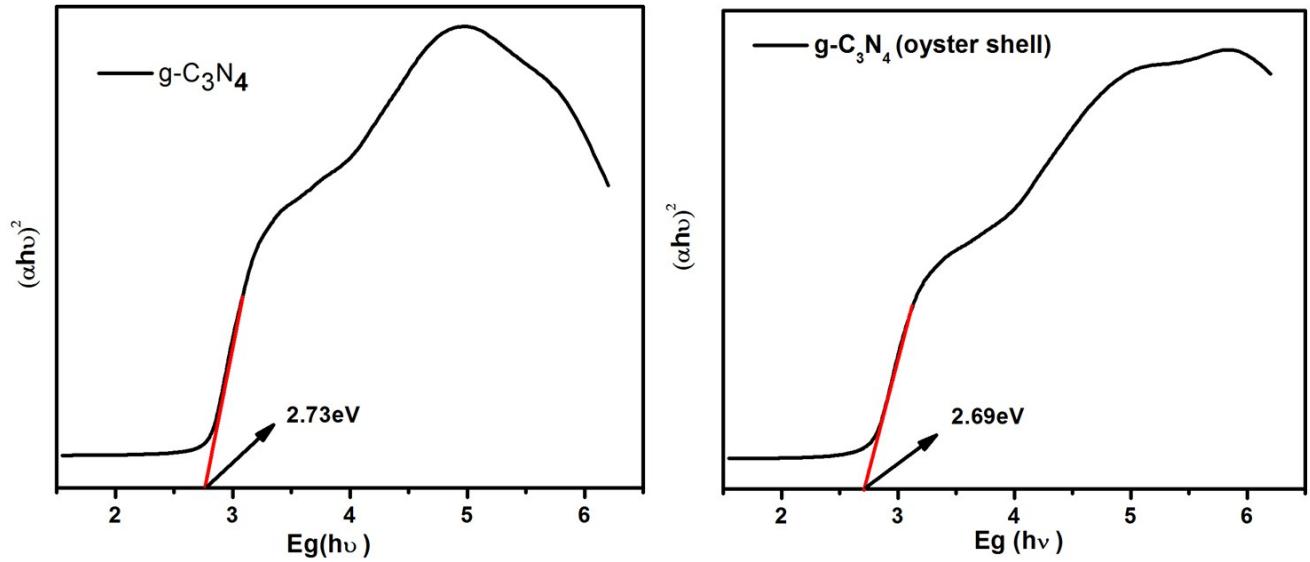
<sup>a</sup>Centre for Nano Science and Nano Technology, Institute of Technical Education and Research, Siksha ‘O’ Anusandhan University, Bhubaneswar-751030, India

<sup>b</sup>Institute of Physics, Sachivalaya Marg, Bhubaneswar- 751005, India

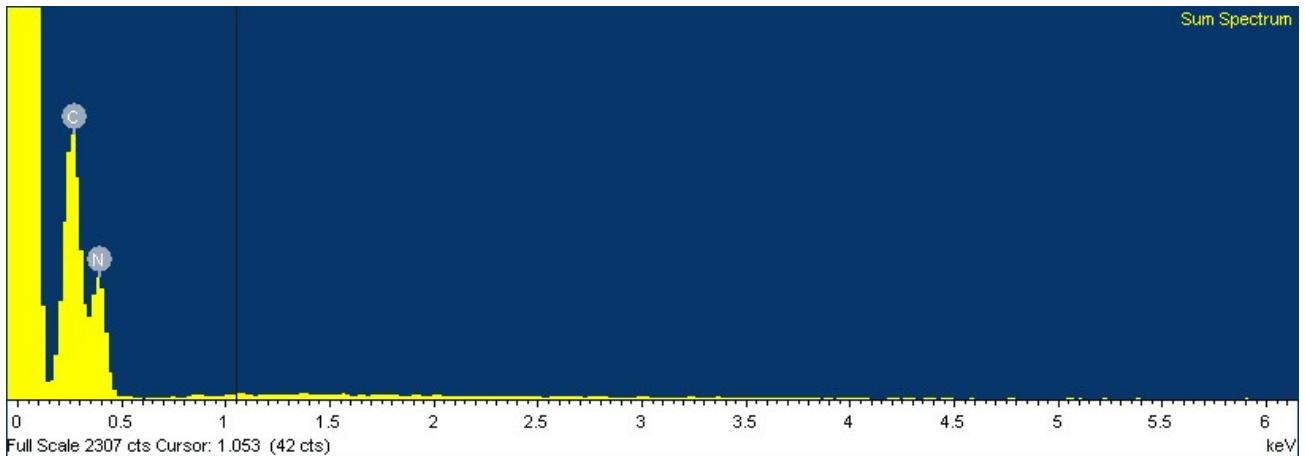
#### FTIR



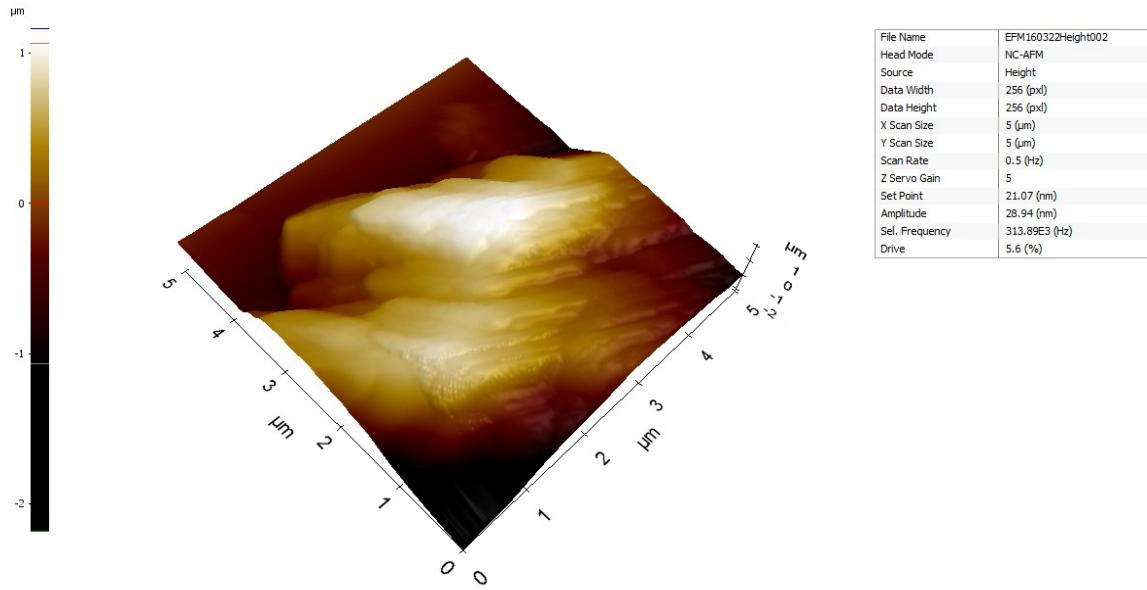
**Fig. S1** FTIR spectrum of g-C<sub>3</sub>N<sub>4</sub> and g-C<sub>3</sub>N<sub>4</sub> (Oyster shell)



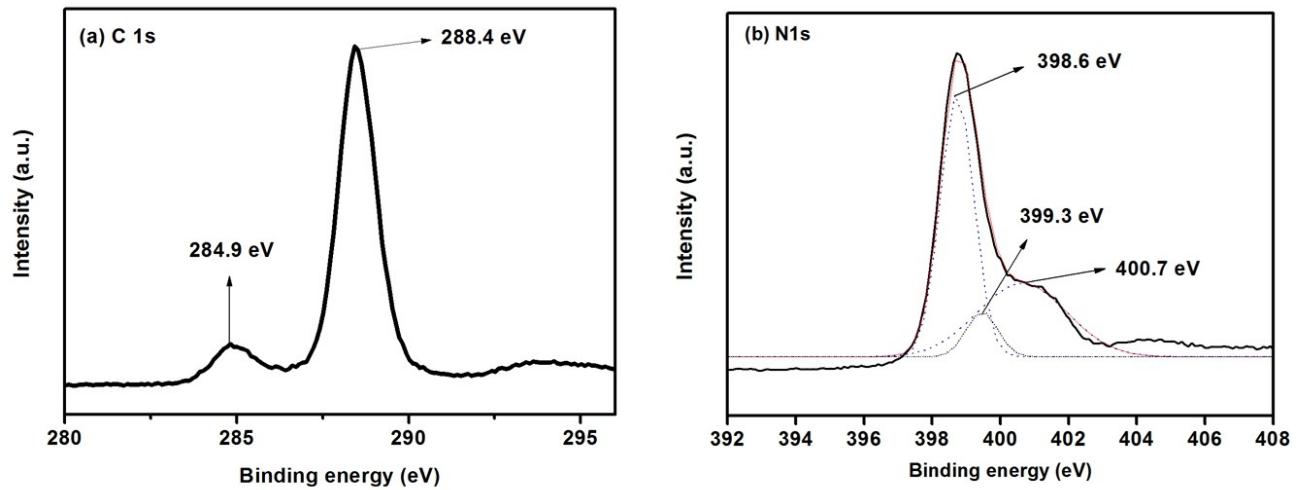
**Fig. S2** Band gap energy determination of g-C<sub>3</sub>N<sub>4</sub> and g-C<sub>3</sub>N<sub>4</sub> (Oyster shell)



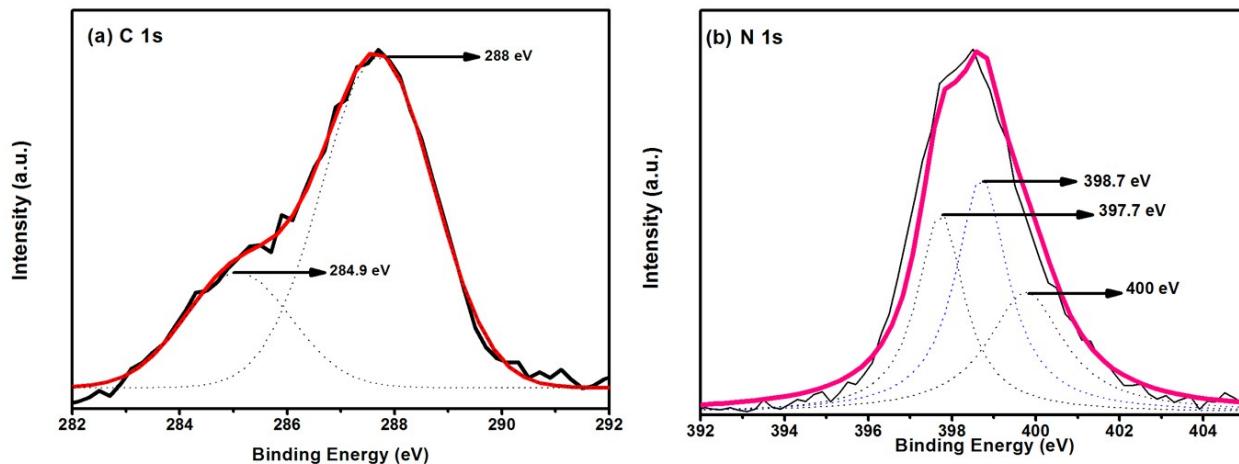
**Fig. S3** EDX study of g-C<sub>3</sub>N<sub>4</sub> (Oyster shell)



**Fig. S4** AFM image of g-C<sub>3</sub>N<sub>4</sub> (oyster shell)



**Fig. S5** XPS spectra of g-C<sub>3</sub>N<sub>4</sub> and g-C<sub>3</sub>N<sub>4</sub>(Oyster shell)



**Fig. S6** XPS spectra of g-C<sub>3</sub>N<sub>4</sub>(Oyster shell)

**Table S1** Various reported work on exfoliated of g-C<sub>3</sub>N<sub>4</sub>

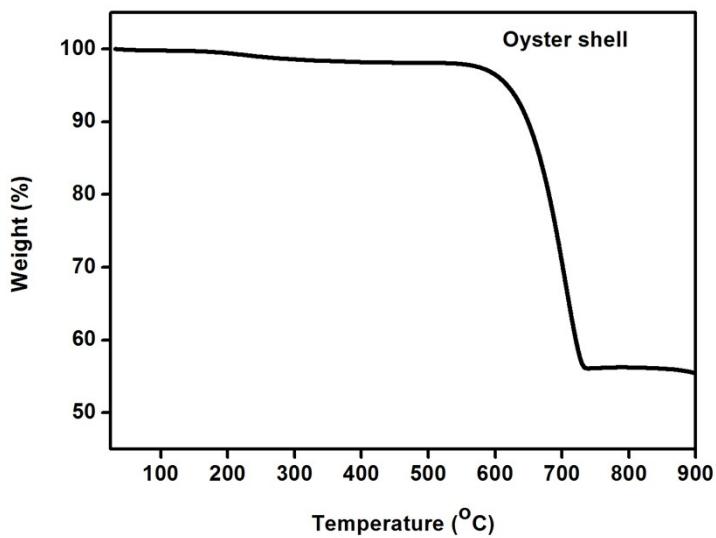
SL. No.	Title	Method of Exfoliation	Ref.
1	Atomically Thin Mesoporous Nanomesh of Graphitic C <sub>3</sub> N <sub>4</sub> for High-efficiency Photocatalytic Hydrogen Evolution	Solvothermal route	1
2	Exfoliated Graphitic Carbon Nitride Nanosheets as Efficient Catalysts for Hydrogen Evolution Under Visible Light	Sonication	2

3	Enhanced Photoresponsive Ultrathin Graphitic-Phase C <sub>3</sub> N <sub>4</sub> Nanosheets for Bioimaging	Liquid exfoliation route	3
4	Crystalline Carbon Nitride Nanosheets for Improved Visible-Light Hydrogen Evolution	Liquid phase exfoliation	4
5	Functionalized Graphitic Carbon Nitride for Metal-free, Flexible and Rewritable Nonvolatile Memory Device via Direct Laser-Writing	Chemically	5
6	Preparation and enhanced visible light photocatalytic activity of novel g-C <sub>3</sub> N <sub>4</sub> nanosheets loaded with Ag <sub>2</sub> CO <sub>3</sub> nanoparticles	Thermally	6
7	Au-Nanoparticle-Loaded Graphitic Carbon Nitride Nanosheets: Green Photocatalytic Synthesis and Application toward the Degradation of Organic Pollutants	Ultrasonication	7
8	Mechanically exfoliated g-C <sub>3</sub> N <sub>4</sub> thin nanosheets by ball milling as high	Mechanical	8

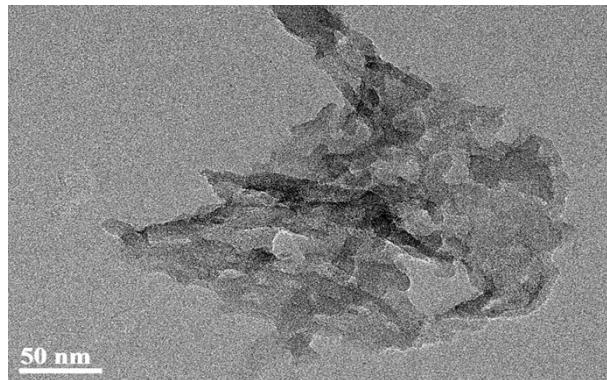
	performance photocatalysts		
9	One step synthesis of exfoliated metal free g-C <sub>3</sub> N <sub>4</sub> via Bio-mediate route for photocatalytic applications	One step Biomediate route (simple thermal condensation of melamine over Oyster shell)	Present work

Table S2: Work reported on p-n homojunction g-C<sub>3</sub>N<sub>4</sub>

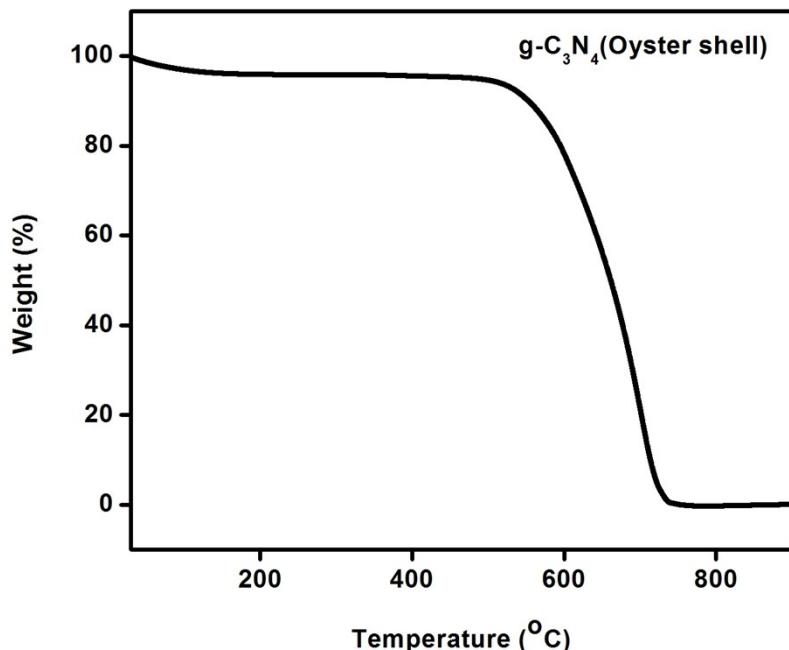
1	Title	Method of preparation	Conversion efficiency (%)	Reference
1	In Situ Bond Modulation of Graphitic Carbon Nitride to Construct p–n Homojunctions for Enhanced Photocatalytic Hydrogen Production	Treatment of g-C <sub>3</sub> N <sub>4</sub> with NaBH <sub>4</sub> at various temperature		9
2	Exfoliated metal free homojunction photocatalyst prepared by biomeditated route for enhanced visible light assisted photocatalytic activity	Thermal condensation of melamine over Oyster shell (biomediate route)	5.71	Present work



**Fig. S7** TGA plot of oyster shell



**Fig. S8** TEM image of g-C<sub>3</sub>N<sub>4</sub> prepared over calcined Oyster shell



**Fig. S9** TGA of g-C<sub>3</sub>N<sub>4</sub> (Oyster shell)

### References:

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