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# Efficient $C_3N_4$/graphene oxide aerogel macroscopic visible-light photocatalyst

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## Supplementary Methods

### Measurement of the specific surface area.

The specific surface area was determined through the MB adsorption method by UV-vis spectroscopy (Shimadzu UV-2600).[1] The SSA of the sample was calculated using the following equation:

$$SSA = \frac{N_A A_{MB} (C_0 - C_e) V}{M_{MB} m_s}$$

where $N_A$ is Avogadro number ($6.02\times10^{23}$ $mol^{-1}$), $A_{MB}$ is the covered area of per $M_B$ molecule (typically assumed to be 1.35 $nm^2$), $C_0$ and $C_e$ are the initial and equilibrium concentrations of MB, respectively, V is the volume of MB solution, $M_{MB}$ is the relative molecular mass of $M_B$, and $m_s$ is the mass of the sample.

## Supplementary Figures


**Figure S1.** The mechanical property of the monolithic $C_3N_4$/GOA and GOA.

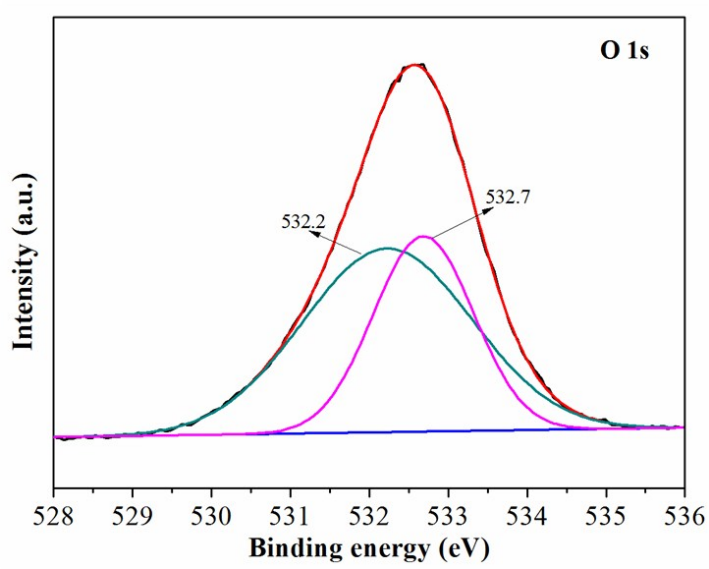


**Figure S2.** The O1s XPS peak of $C_3N_4$/GOA.

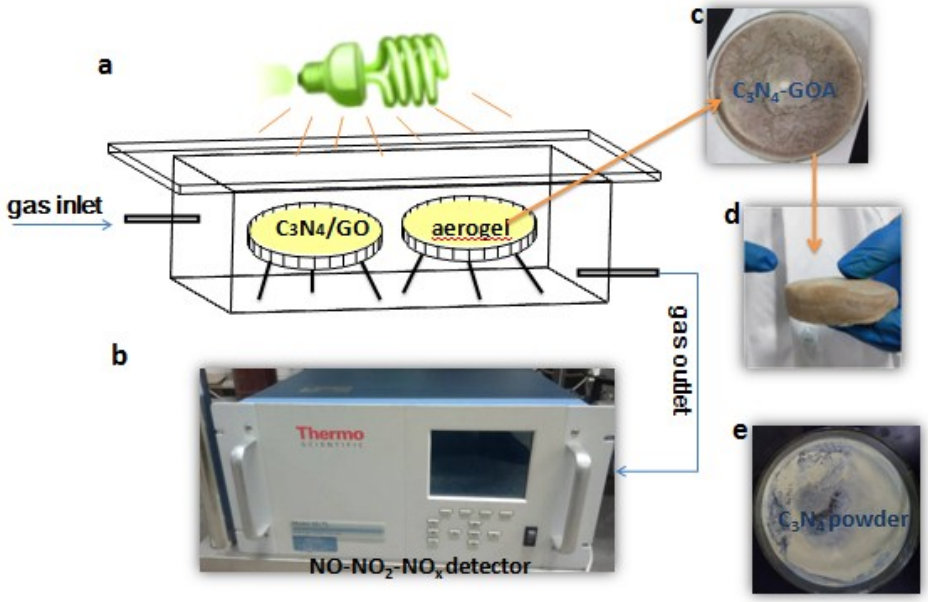


**Figure S3.** The schematic of NO removal device: (a) the reactor, (b) the NO detector, (c) The $C_3N_4$/GOA sample in the petri dish for experiment, (d) the sample being taken up and (e) the powdery $C_3N_4$ in the petri dish.

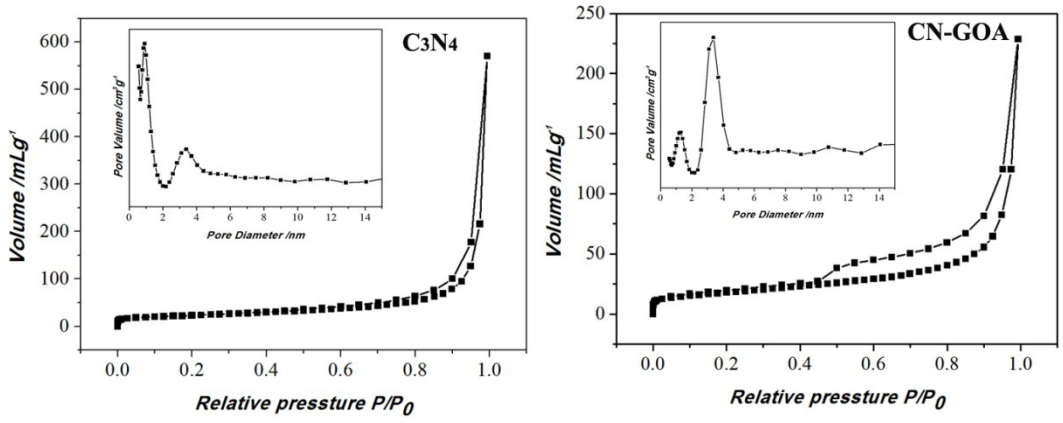


**Figure S4.** Nitrogen adsorption/desorption isotherm of the powdery $C_3N_4$ and $C_3N_4$/GOA with 90wt% of $C_3N_4$ (inset: pore volume of the corresponding samples).

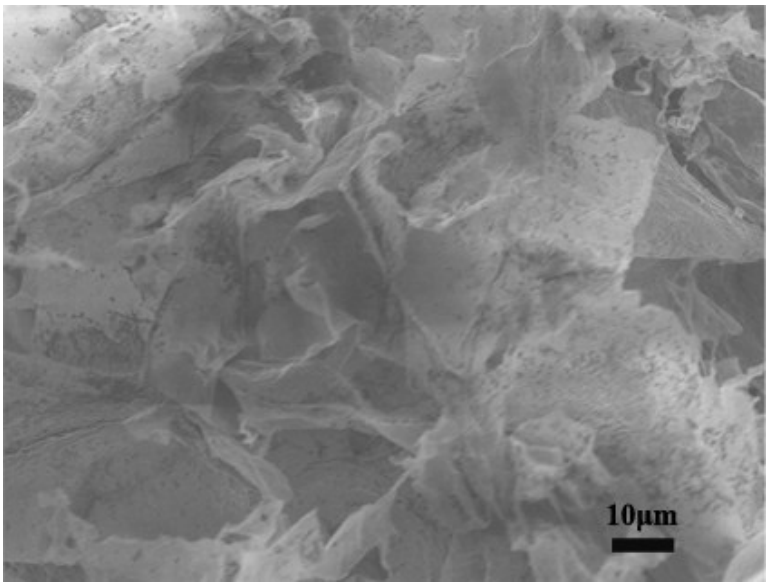


**Figure S5.** SEM image of $C_3N_4$/GOA after photocatalytic oxidation of NO

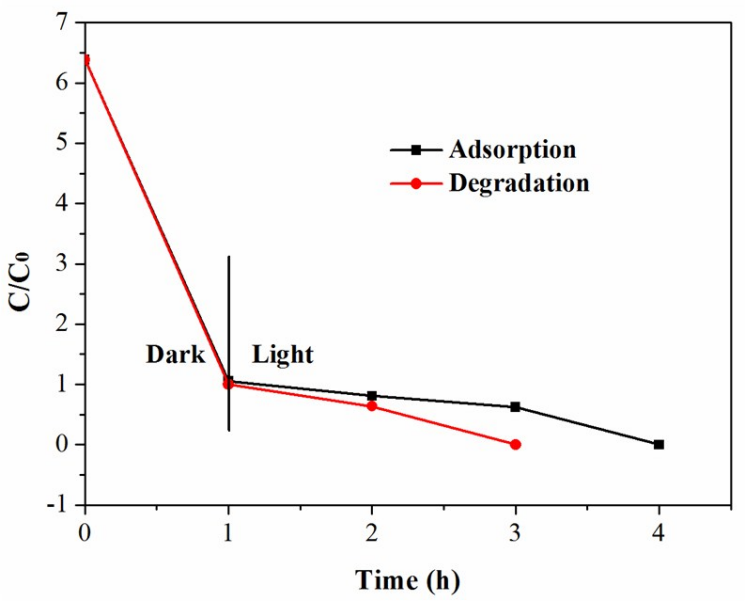


**Figure S6.** The adsorption and photodegradation for RhB over $C_3N_4$/GOA under visible light irradiation

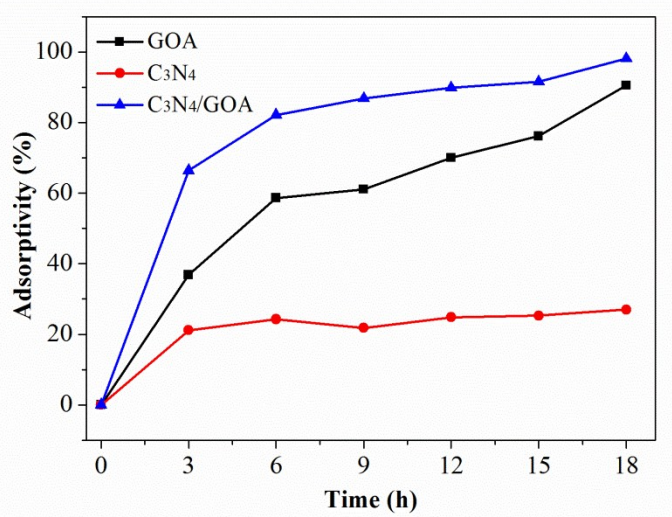


**Figure S7.** The adsorption for methylene blue (MB) over GO, $C_3N_4$/GOA and powdery $C_3N_4$.

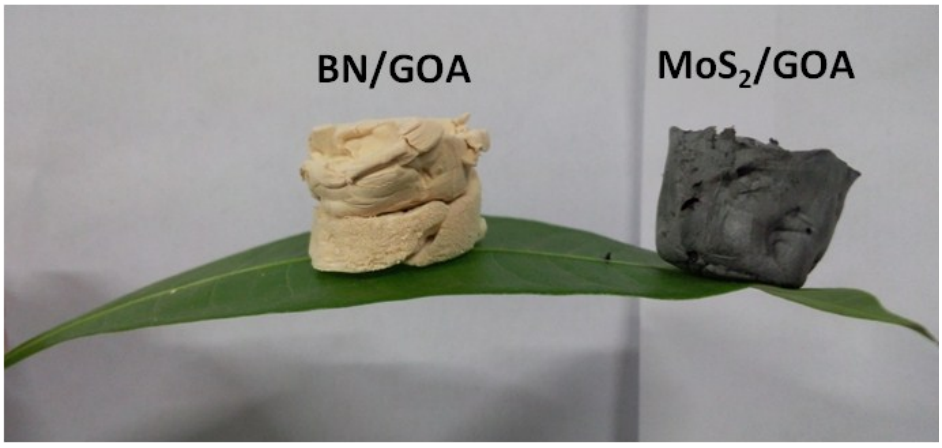


**Figure S8.** Photographs of BN/GOA and $MoS_2$/GOA.

**Supplementary Tables**

**Table S1.** The modeling of *R-C* values of $C_3N_4$ and $C_3N_4$/GOA

| | $C_3N_4$-dark | $C_3N_4$-light | $C_3N_4$/GOA-dark | $C_3N_4$/GOA-light |
|---|---|---|---|---|
| Ro ($\Omega$ cm$^2$) | 4.031 | 4.248 | 3 | 3.084 |
| Co (F cm$^{-2}$) | 8.2767E-08 | 8.0658E-08 | 2.1169E-07 | 1.7985E-07 |
| Wo -P | 0.23616 | 0.29589 | 0.39644 | 0.32383 |
| Rs ($\Omega$ cm$^2$) | 16.13 | 16.07 | 17 | 16.72 |
| $R_1$ ($\Omega$ cm$^2$) | 2015 | 1524 | 27.3 | 21.72 |
| CPE1-P | 0.92892 | 0.94455 | 0.48976 | 0.50376 |
| CPE1-T (S cm$^{-2}$ S$^p$) | 0.00030993 | 0.00075723 | 0.0057034 | 0.0060799 |
| $R_2$ ($\Omega$ cm$^2$) | 4834 | 806.4 | 924.8 | 514.8 |
| $C_2$ (F cm$^{-2}$) | 0.00018709 | 0.00096299 | 0.012702 | 0.011492 |

**Ro:** the resistance of Pt electrode;

**$R_1$:** the resistance of work electrode, CPE1-P and CPE1-T: the deviation of constant phase angle;

**Rs:** the resistance of the solution;

**$R_2$:** the resistance of the reaction;

## Supplementary References

1. Yang, C., Shen, J., Wang, C., Fei, H., Bao, H., Wang, G. *J. Mater. Chem. A.* **2,** 1458 (2014).