

## **Supporting Information**

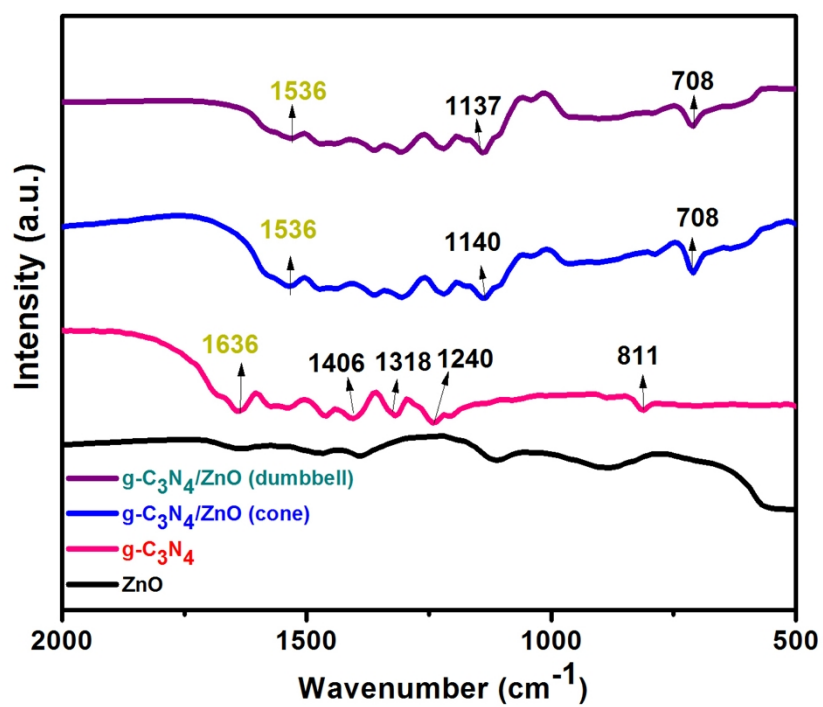
### **Graphitic-carbon nitride support for the synthesis of shape-dependent ZnO and their application in visible light photocatalyst**

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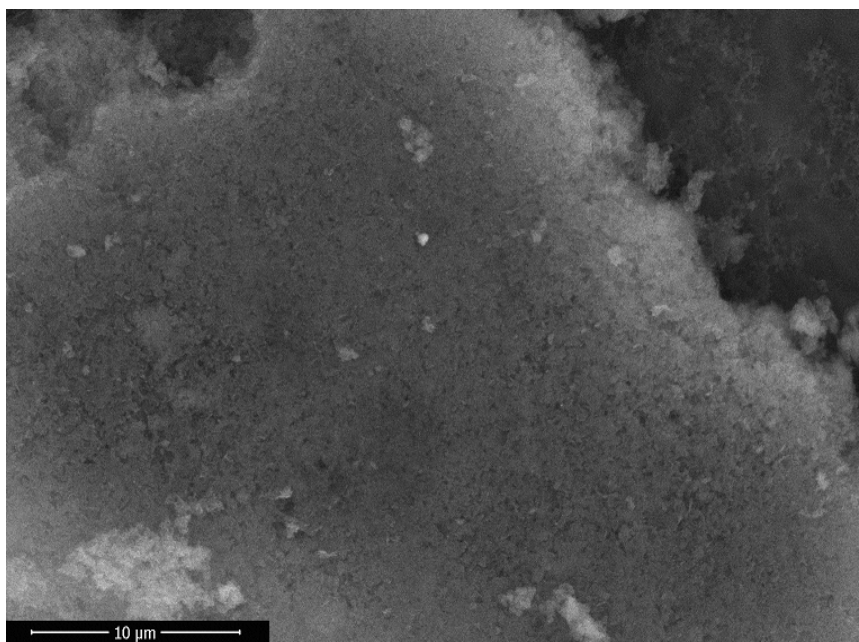
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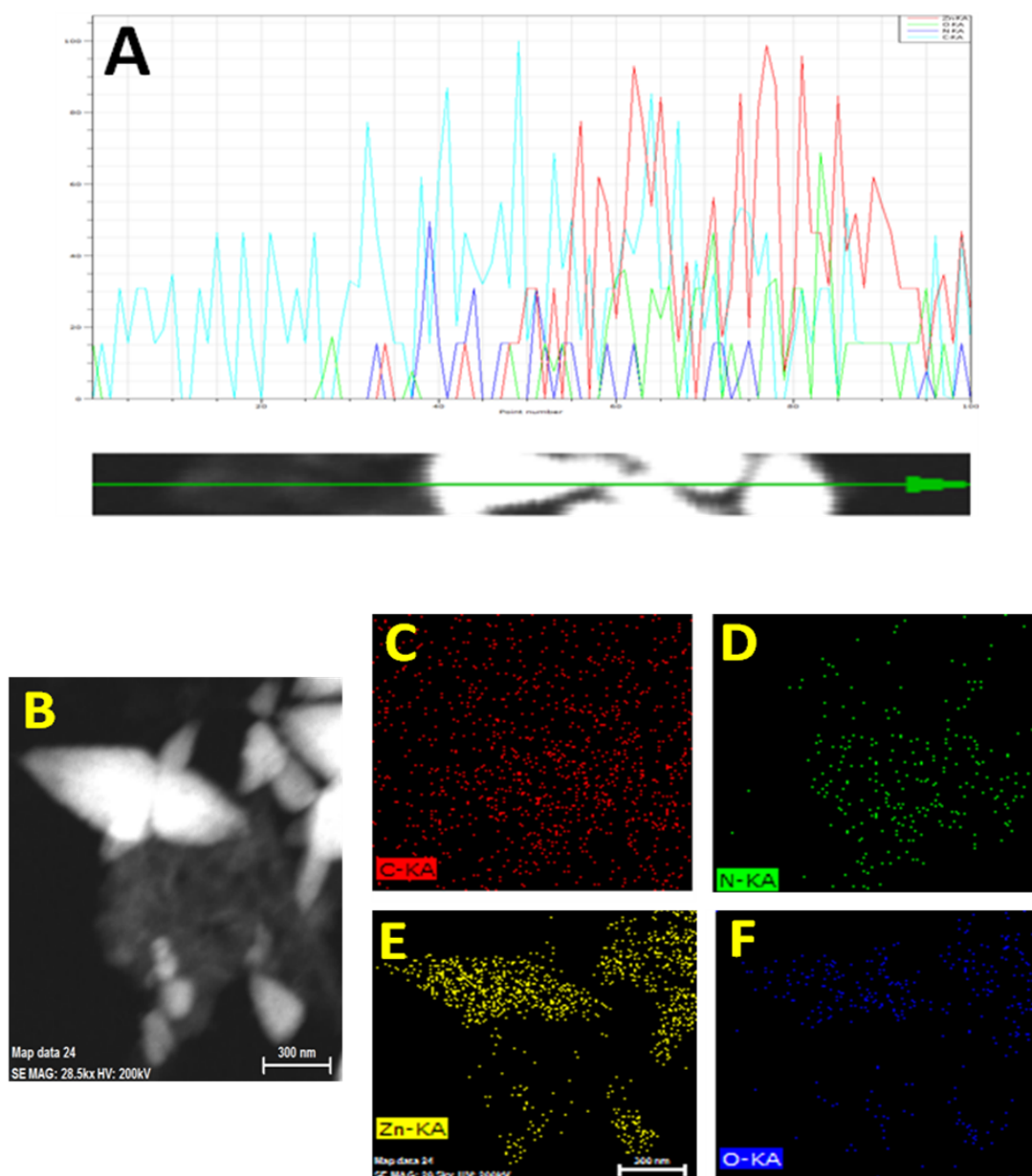
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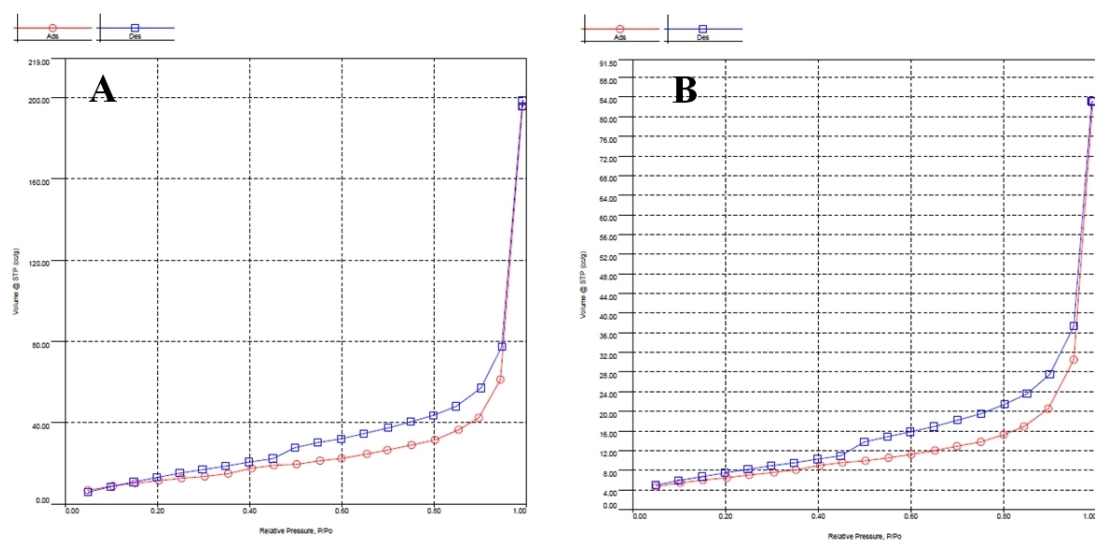
**Figure S1.** FTIR spectra of bare g-C<sub>3</sub>N<sub>4</sub>, ZnO, g-C<sub>3</sub>N<sub>4</sub>/ZnO (dumbbells), and g-C<sub>3</sub>N<sub>4</sub>/ZnO (cones). All the powder samples were mixed with KBr reference to form a pellet.



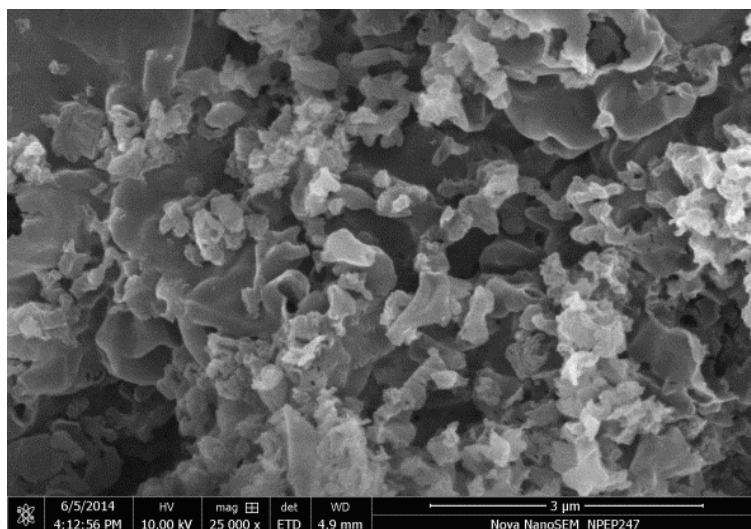
**Figure S2.** FESEM image of bare g-C<sub>3</sub>N<sub>4</sub> surface



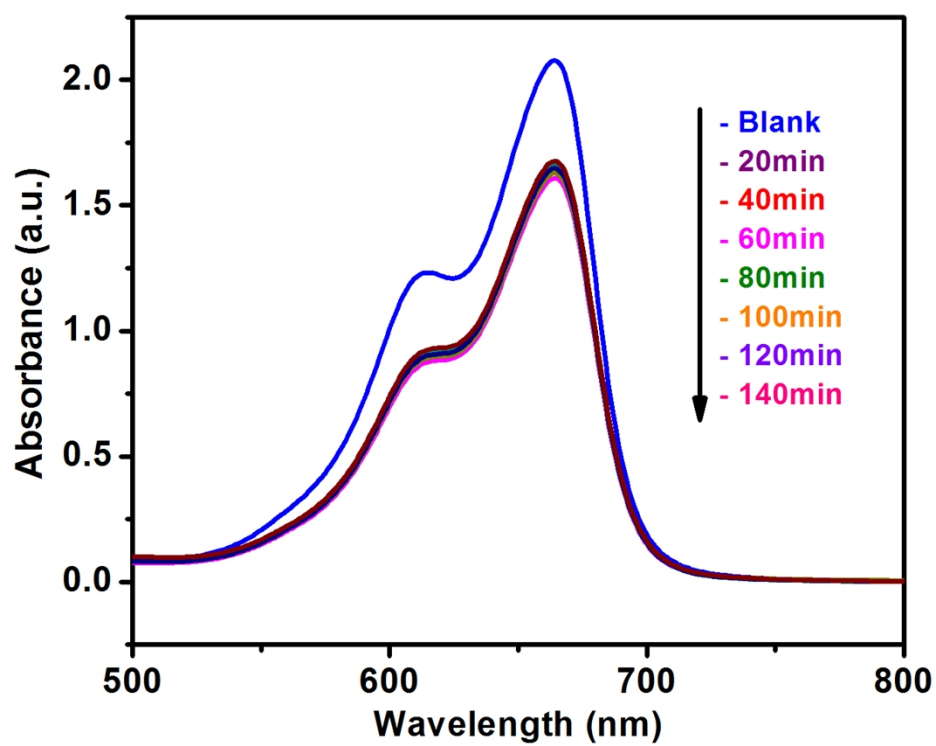
**Figure S3.** (a) EDS line spectrum of g-C<sub>3</sub>N<sub>4</sub>/ZnO (cone), (b) FESEM image from where line spectrum and point mapping were performed, and (c, d, e, f) point mapping of C, N, Zn, and O respectively in g-C<sub>3</sub>N<sub>4</sub>/ZnO cone heterostructures.



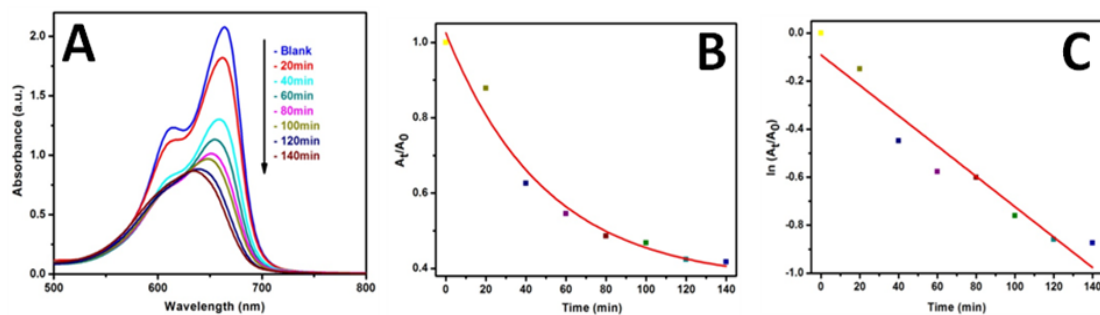
**Figure S4.** N<sub>2</sub> adsorption-desorption isotherm using g-C<sub>3</sub>N<sub>4</sub>/ZnO dumbbell (A) and cone (B) structures.



**Figure S5.** FESEM image of g-C<sub>3</sub>N<sub>4</sub>/ZnO aggregated form, synthesized without using CTAB keeping all other conditions same.

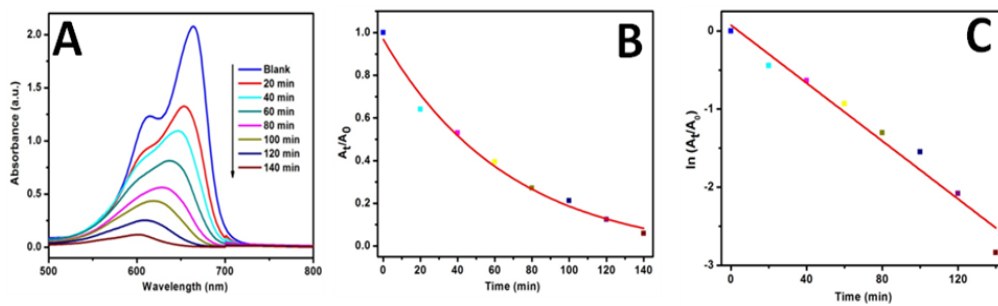


**Figure S6.** UV-vis spectra of MB adsorption-desorption equilibrium in dark with g-C<sub>3</sub>N<sub>4</sub>/ZnO heterostructure catalyst.

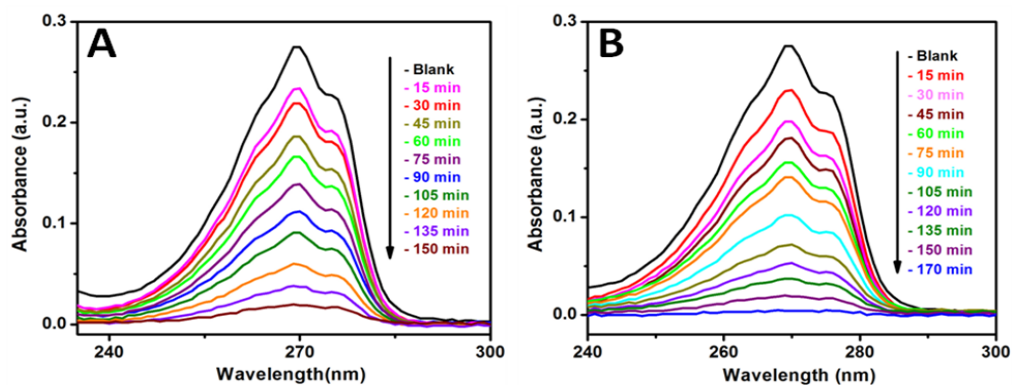


**Figure S7.** UV-vis spectra of (a) degradation of MB in presence of g-C<sub>3</sub>N<sub>4</sub>, (b)  $A_t/A_0$  vs. time (min) plot, and (c)  $\ln(A_t/A_0)$  vs. time (min) plot. Conditions: [MB] =  $3 \times 10^{-5}$  M and amount of catalyst = 5.0 mg.

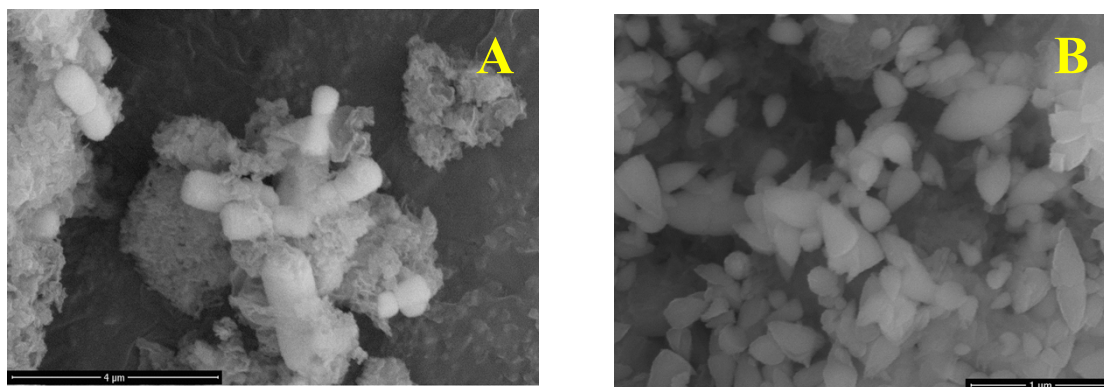




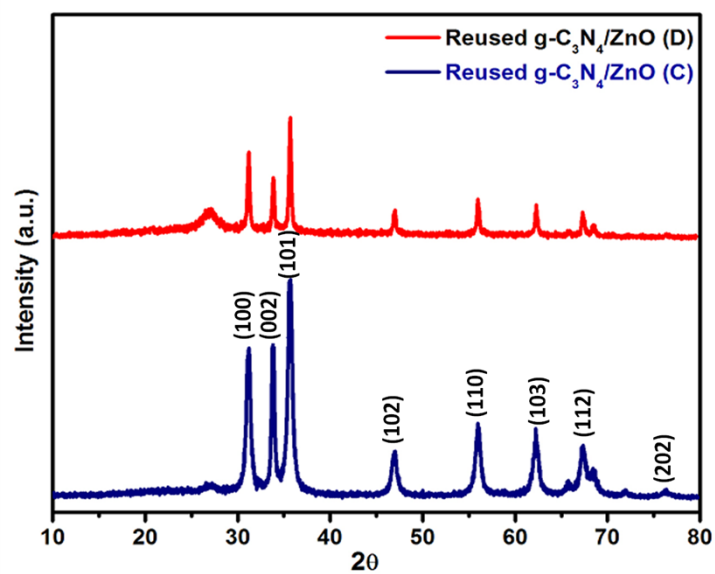
**Figure S8.** UV-vis spectra of (a) Degradation of MB in presence of g-C<sub>3</sub>N<sub>4</sub>/ZnO (cone), (b)  $A_t/A_0$  vs. time (min) plot, and (c)  $\ln(A_t/A_0)$  vs. time (min) plot. Conditions: [MB] =  $3 \times 10^{-5}$  M and amount of catalyst = 5.0 mg.



**Figure S9.** UV-vis spectra of phenol decomposition using (a) g-C<sub>3</sub>N<sub>4</sub>/ZnO (dumbbell) and (b) g-C<sub>3</sub>N<sub>4</sub>/ZnO (cone) catalyst, under irradiation of visible light. Conditions: [phenol] =  $2 \times 10^{-4}$  M and amount of catalyst = 5.0 mg.



**Figure S10.** FESEM image of reused (A) g-C<sub>3</sub>N<sub>4</sub>/ZnO (dumbbell) and (B) g-C<sub>3</sub>N<sub>4</sub>/ZnO (cone) catalyst after 3<sup>rd</sup> cycle.



**Figure S11.** PXRD patterns of reused g-C<sub>3</sub>N<sub>4</sub>/ZnO (dumbbell) and g-C<sub>3</sub>N<sub>4</sub>/ZnO (cone) catalyst after 3<sup>rd</sup> cycle.