Supporting Information

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

Pragati Fageria, a Roshan Nazir, a Subhashis Gangopadhyay, b Harish C. Barshilia, c and Surojit Pande a*

a Department of Chemistry, Birla Institute of Technology and Science, Pilani, Rajasthan, 333031, India.
b Department of Physics, Birla Institute of Technology and Science, Pilani, Rajasthan, 333031, India.
c Surface Engineering Division, CSIR—National Aerospace Laboratories, Bangalore 560017, India.
Figure S1. FTIR spectra of bare g-C$_3$N$_4$, ZnO, g-C$_3$N$_4$/ZnO (dumbbells), and g-C$_3$N$_4$/ZnO (cones). All the powder samples were mixed with KBr reference to form a pellet.
Figure S2. FESEM image of bare g-C₃N₄ surface
Figure S3. (a) EDS line spectrum of g-C$_3$N$_4$/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$_3$N$_4$/ZnO cone heterostructures.
**Figure S4.** $\text{N}_2$ adsorption-desorption isotherm using g-$\text{C}_3\text{N}_4$/ZnO dumbbell (A) and cone (B) structures.
Figure S5. FESEM image of g-C$_3$N$_4$/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$_3$N$_4$/ZnO heterostructure catalyst.
Figure S7. UV-vis spectra of (a) degradation of MB in presence of g-C$_3$N$_4$, (b) $A_t/A_0$ vs. time (min) plot, and (c) ln ($A_t/A_0$) vs. time (min) plot. Conditions: [MB] = 3×10$^{-5}$ M and amount of catalyst = 5.0 mg.
Figure S8. UV-vis spectra of (a) Degradation of MB in presence of g-C₃N₄/ZnO (cone), (b) \( A_t/A_0 \) vs. time (min) plot, and (c) \( \ln (A_t/A_0) \) vs. time (min) plot. Conditions: \([MB] = 3 \times 10^{-5} \text{ M}\) and amount of catalyst = 5.0 mg.
Figure S9. UV-vis spectra of phenol decomposition using (a) g-C$_3$N$_4$/ZnO (dumbbell) and (b) g-C$_3$N$_4$/ZnO (cone) catalyst, under irradiation of visible light. Conditions: [phenol] = 2×10$^{-4}$ M and amount of catalyst = 5.0 mg.
**Figure S10.** FESEM image of reused (A) g-C$_3$N$_4$/ZnO (dumbbell) and (B) g-C$_3$N$_4$/ZnO (cone) catalyst after 3$^{rd}$ cycle.
Figure S11. PXRD patterns of reused g-C$_3$N$_4$/ZnO (dumbbell) and g-C$_3$N$_4$/ZnO (cone) catalyst after 3$^{rd}$ cycle.