Electronic Supplementary Information

Inlay of $Bi_2O_2CO_3$ nanoparticles onto Bi_2WO_6 nanosheets to build heterostructured photocatalysts

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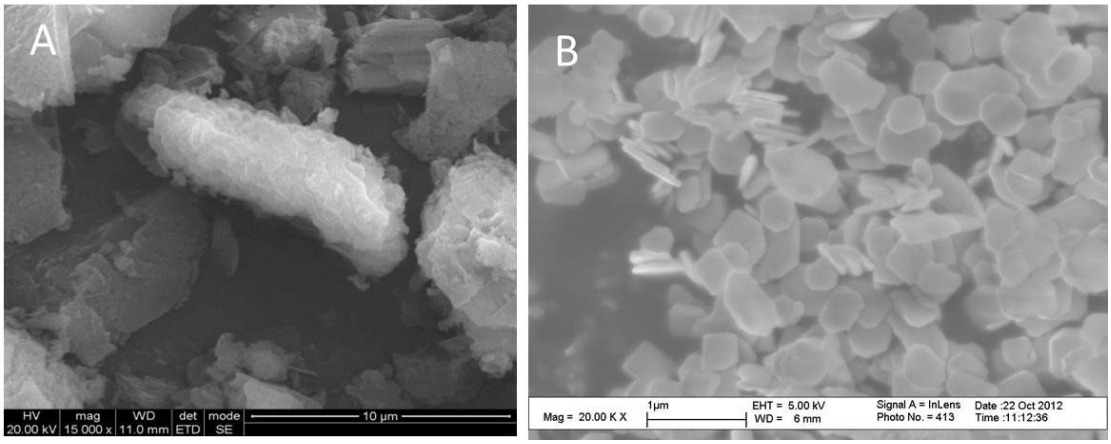

Fig. S1 SEM images of g-C_3N_4 (A) and $Bi_2O_2CO_3$ (B).

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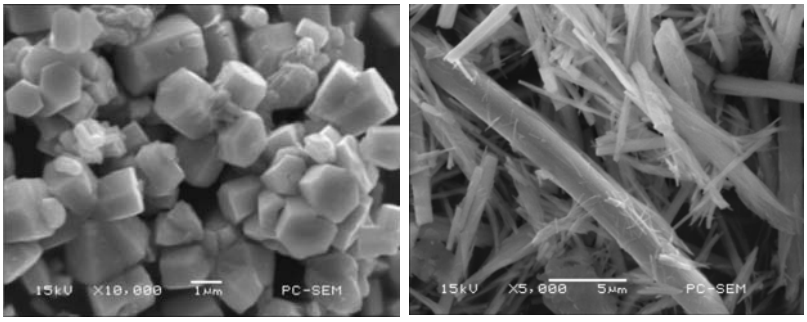

Fig. S2 SEM images of the ZnO samples obtained with g-C_3N_4 as a source of NH_4^+ via hydrothermal process.

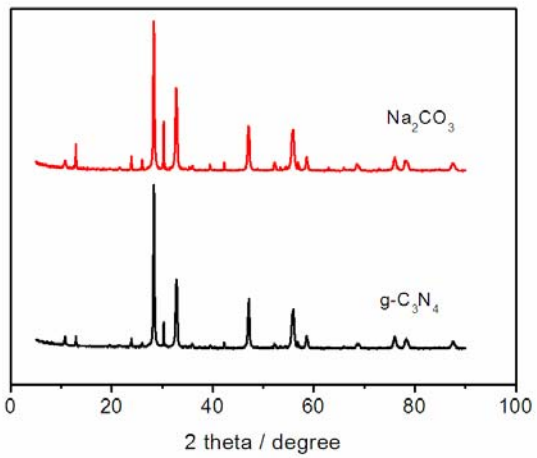

Fig. S3 XRD patterns of the $Bi_2O_2CO_3/Bi_2WO_6$ nanocomposites prepared using g-C_3N_4 or Na_2CO_3 as a source of CO_3^{2-}.

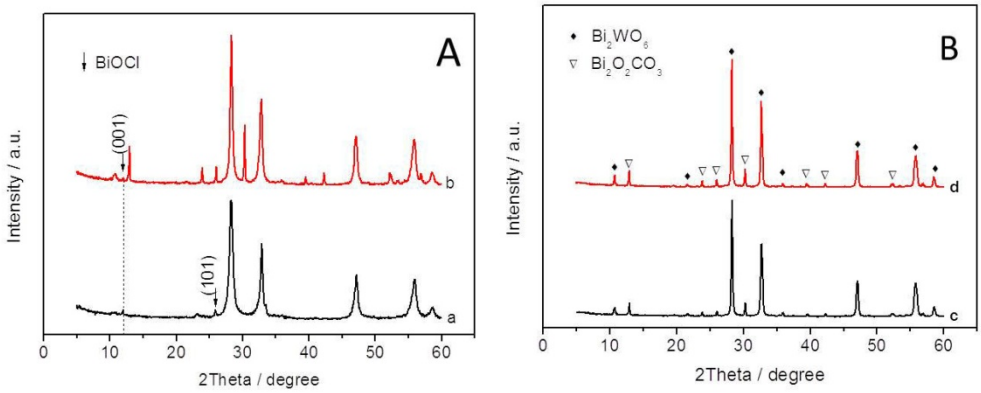

Fig. S4 XRD patterns of the samples prepared with different volume of NaOH, (a) 5.0 mL, (b) 6.0 mL, (c) 7.0 mL, and (d) 8.0 mL.

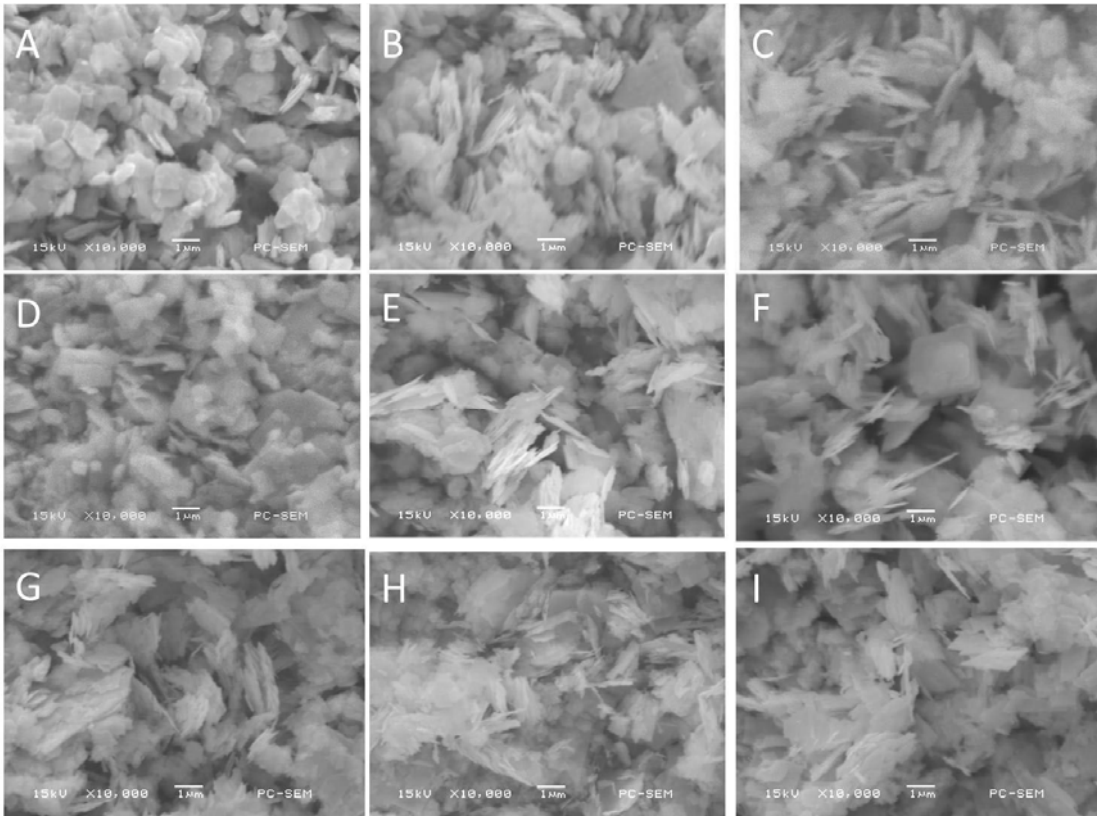

Fig. S5 SEM images of the samples prepared with different volume of NaOH, (A) 5.0 mL, (B) 6.0 mL, (C) 7.0 mL, (D) 8.0 mL, (E) 6.4 mL, (F) 6.5 mL, (G) 6.6 mL, (H) 6.7 mL, and (I) 6.8 mL.

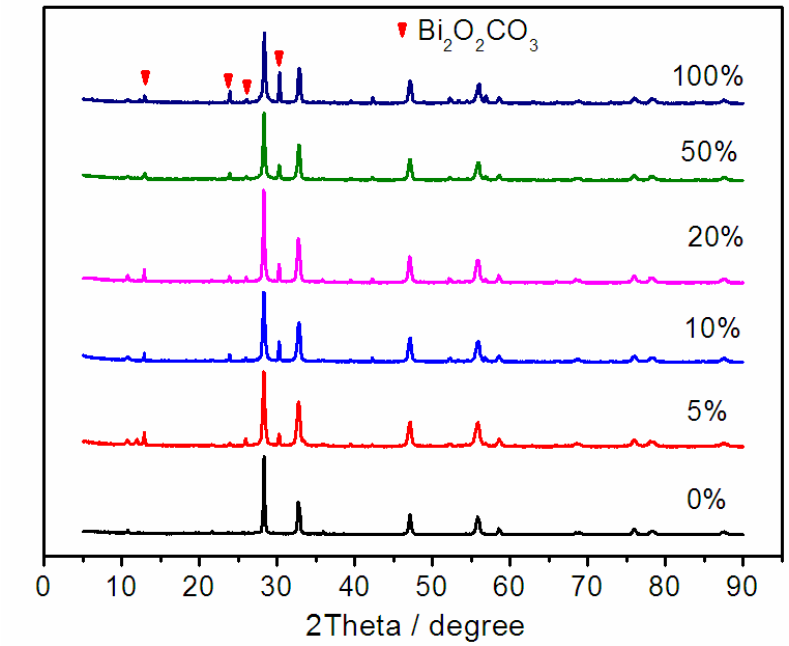

Fig. S6 XRD patterns of the $Bi_2O_2CO_3/Bi_2WO_6$ composites prepared using different amounts of g-C_3N_4.

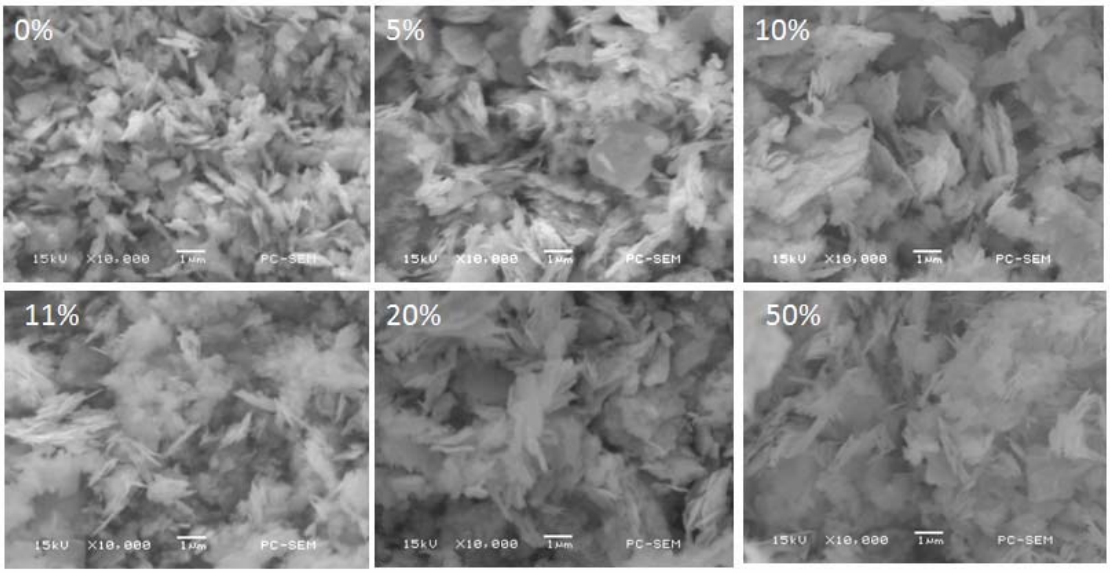

Fig. S7 SEM images of the $Bi_2O_2CO_3/Bi_2WO_6$ composites prepared using different amounts of g-C_3N_4.

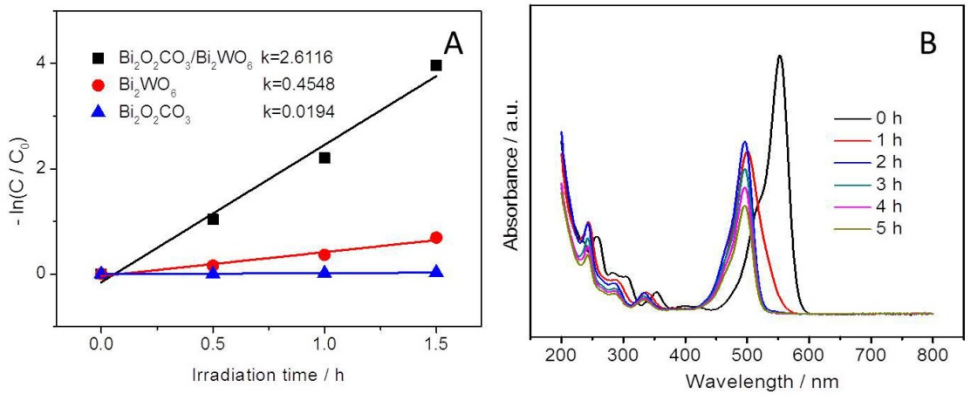

Fig. S8 (A) Plots of degradation rate of RhB over $Bi_2O_2CO_3$, Bi_2WO_6 and $Bi_2O_2CO_3/Bi_2WO_6$ under visible light irradiation (*k* is the apparent rate constant, h^{-1}). (B) Absorption spectra change of the RhB solution during the photocatalytic reaction.

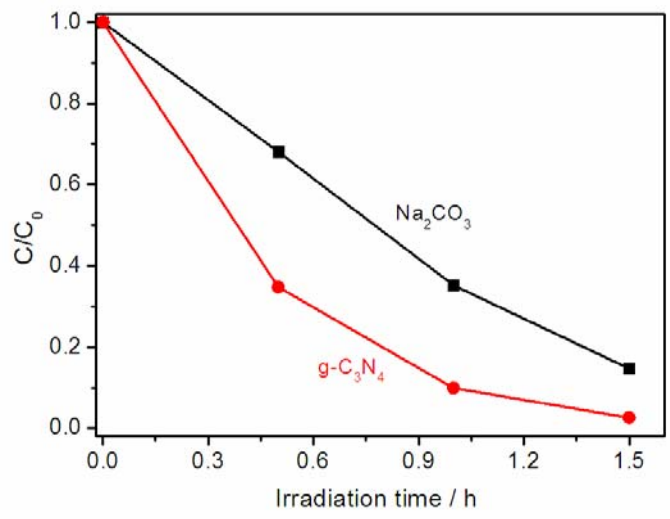

Fig. S9 Plots of degradation of RhB over $Bi_2O_2CO_3/Bi_2WO_6$ obtained using Na_2CO_3 or g-C_3N_4 as the source of CO_3^{2-} under visible light irradiation. In the direct hydrothermal process, the molar ratio of the starting materials is 1:0.5:0.04 ($Bi(NO_3)_3{\cdot}5H_2O$: $Na_2WO_4{\cdot}2H_2O$: Na_2CO_3).

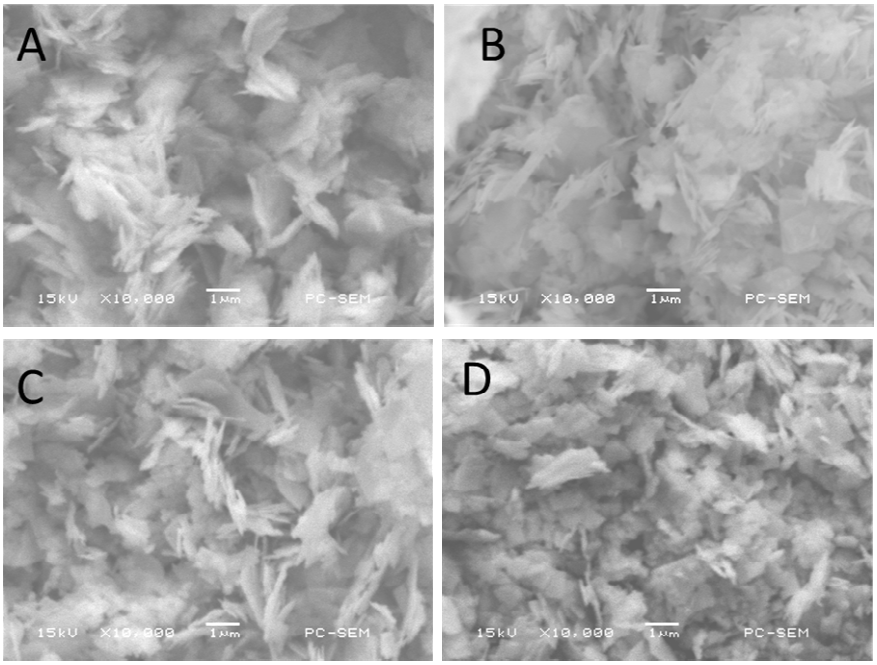

Fig. S10 SEM images of the $Bi_2O_2CO_3/Bi_2WO_6$ composites attained after reaction for (A) 8 h, (B) 12 h, (C) 16 h, and (D) 20 h.

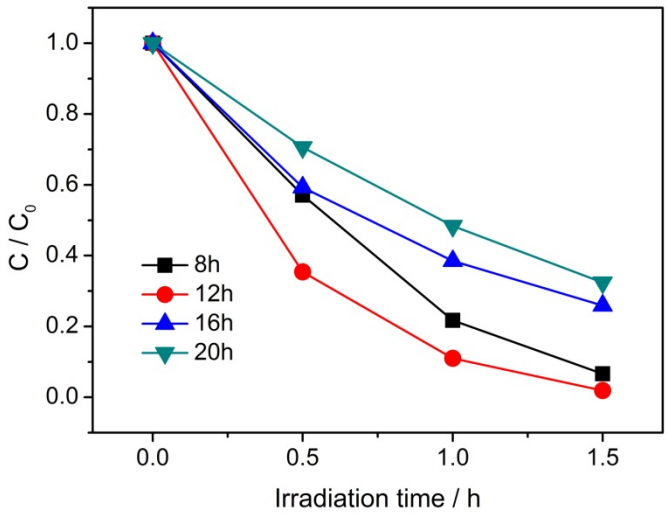

Fig. S11 Comparison of photocatalytic activity of the $Bi_2O_2CO_3/Bi_2WO_6$ composites attained after reaction for (A) 8 h, (B) 12 h, (C) 16 h, and (D) 20 h towards the degradation of RhB under visible light irradiation.

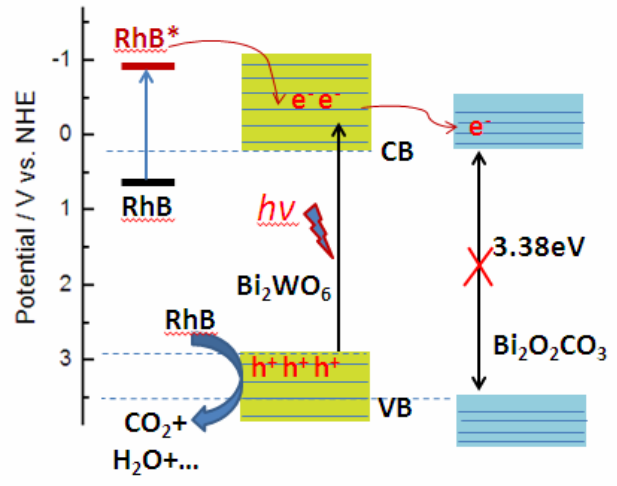

Fig. S12 Schematic diagram for the energy band structure of the $Bi_2O_2CO_3/Bi_2WO_6$ and the possible charge transfer process under visible light irradiation.

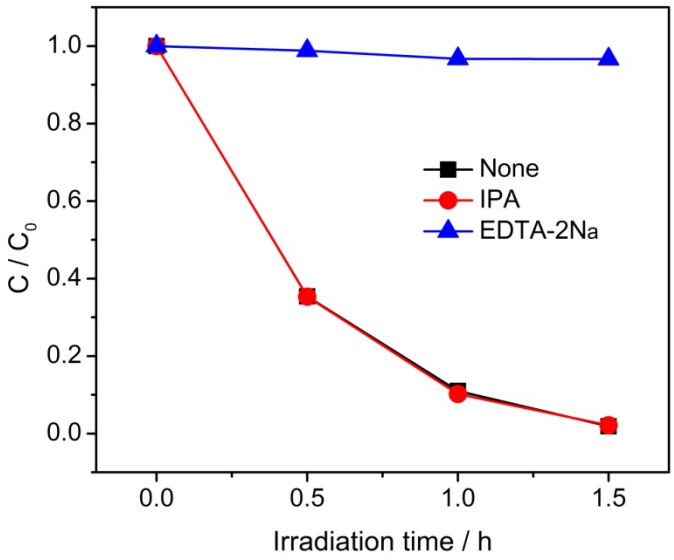

Fig. S13 Plots of Photogenerated carries trapping in the system of photocatalytic degradation of RhB over $Bi_2O_2CO_3/Bi_2WO_6$ under visible light irradiation.