Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Photocatalytic Performance Enhanced via P3HT-g-C_3N_4 Heterojunction

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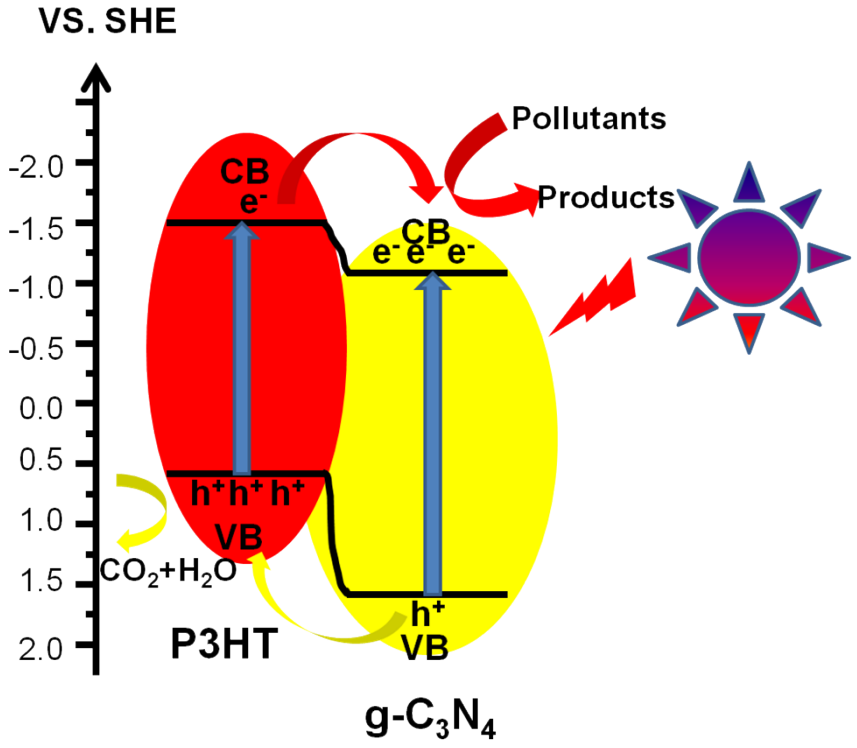

Figure S1 Schematic illustration of organic heterojunction formed between P3HT and g-C_3N_4.

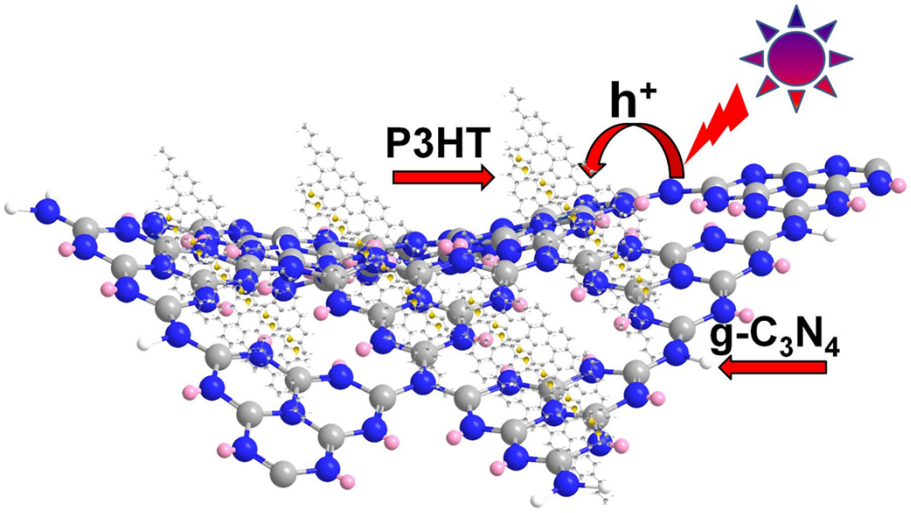

Figure S2 Schematic illustration of charge separation and photocatalytic process over $g\text{-}C_3N_4$ and P3HT-$g\text{-}C_3N_4$ photocatalysts under visible light irradiation.

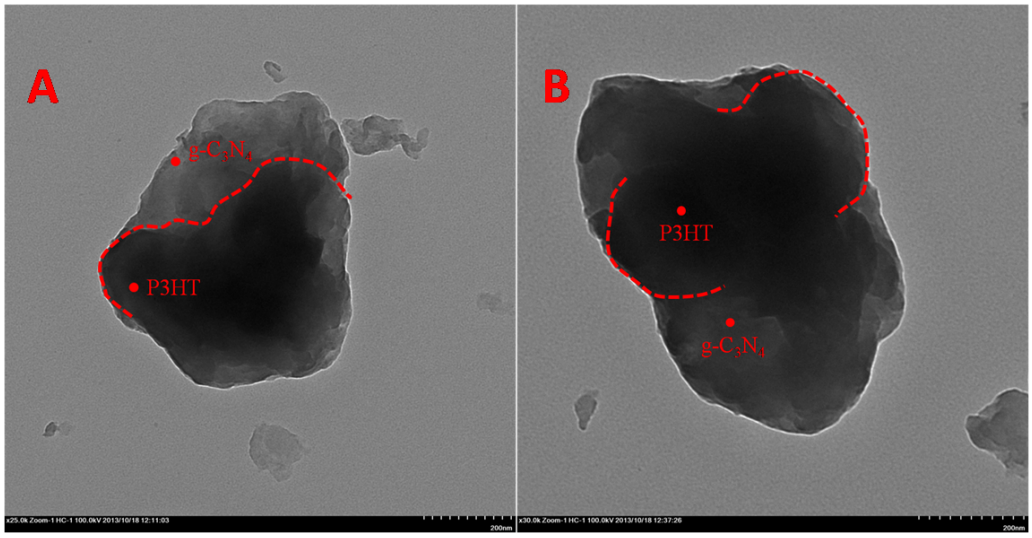

Figure S3. (A. B) TEM images of P3HT-$g\text{-}C_3N_4$ composites from a different perspective.

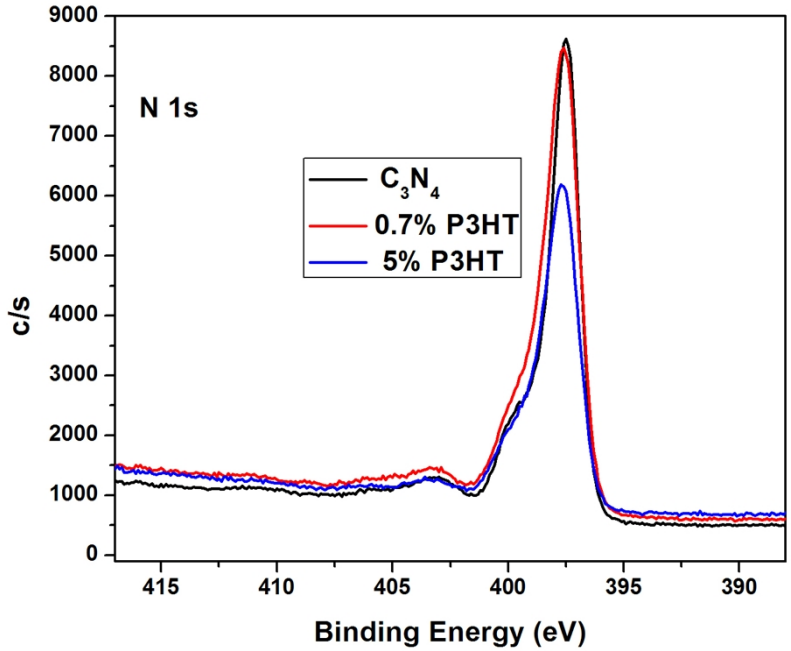

Figure S4. High-resolution XPS spectra of N1s recorded from P3HT, g-C_3N_4 and P3HT-g-C_3N_4.

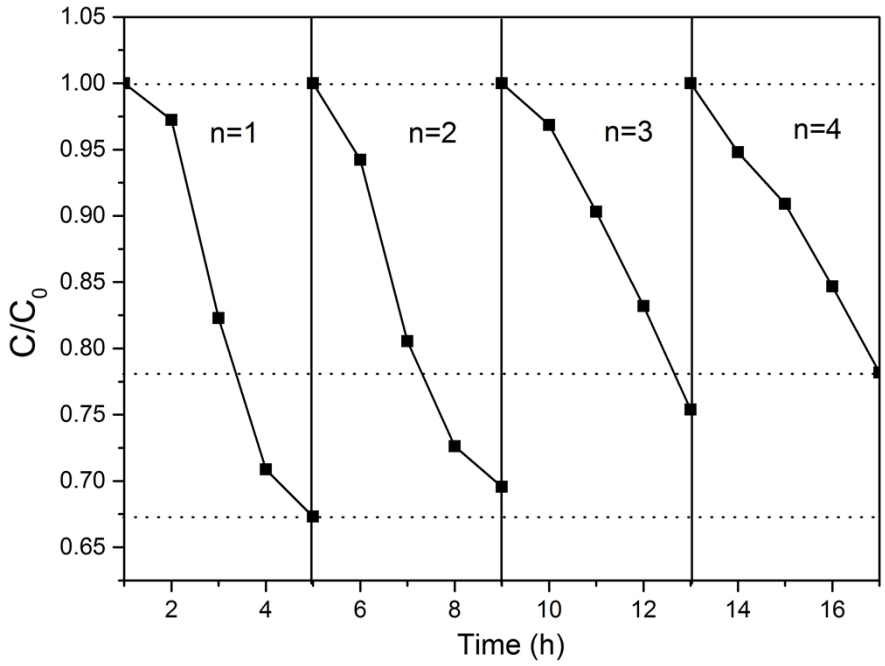

Figure S5. Photostability experiments for photocatalytic degradation of MB over 0.7 wt.% P3HT-g-C_3N_4 photocatalyst under visible light irradiation. ([MB] = 3×10^{-5}mol/L, $\lambda\geqslant420$ nm).

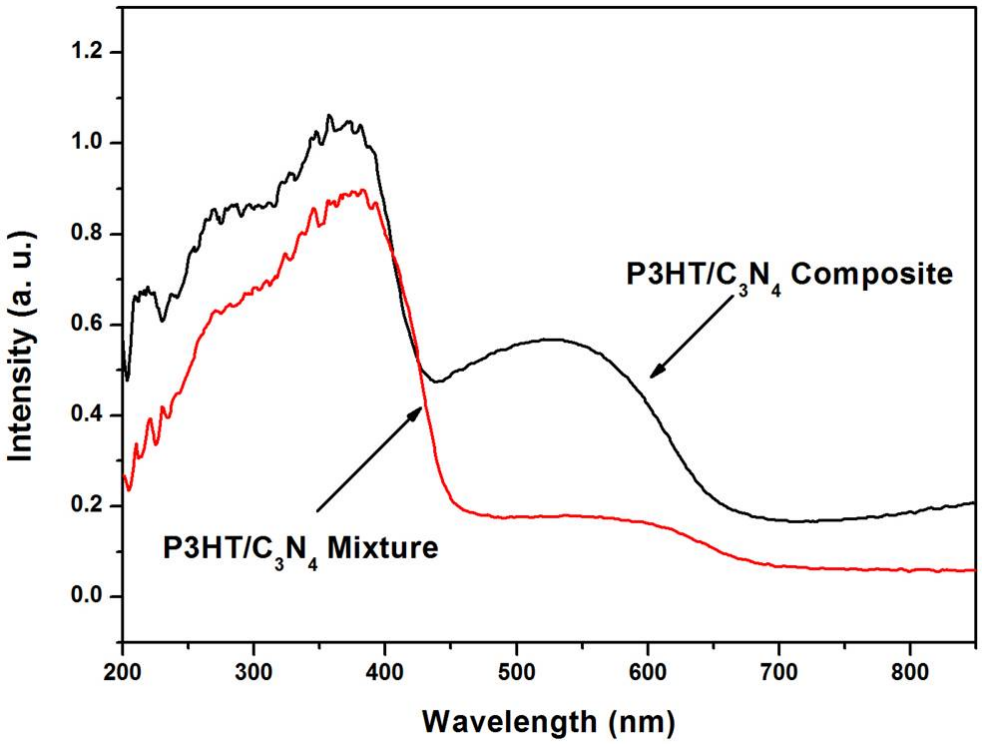

Figure S6 DRS of P3HT-g-C_3N_4 polymer composite and mixture

The N_2 adsorption/desorption isotherms are demonstrated as shown in Figure S3. The BET surface area (S_{BET}) of the pure g-C_3N_4 and 5.0 wt.% composites was 15.8 and 4.8 m^2 g^{-1} respectively, while that of 0.7 wt.% composites was 3.8 m^2 g^{-1}, which is lower than pure g-C_3N_4 and 5.0 wt.% composites. This result demonstrated that the S_{BET} of the P3HT-g-C_3N_4 composite catalysts decreased with the addition of P3HT, indicating that the specific surface area does not contribute to photocatalytic activity of composite photocatalysts.

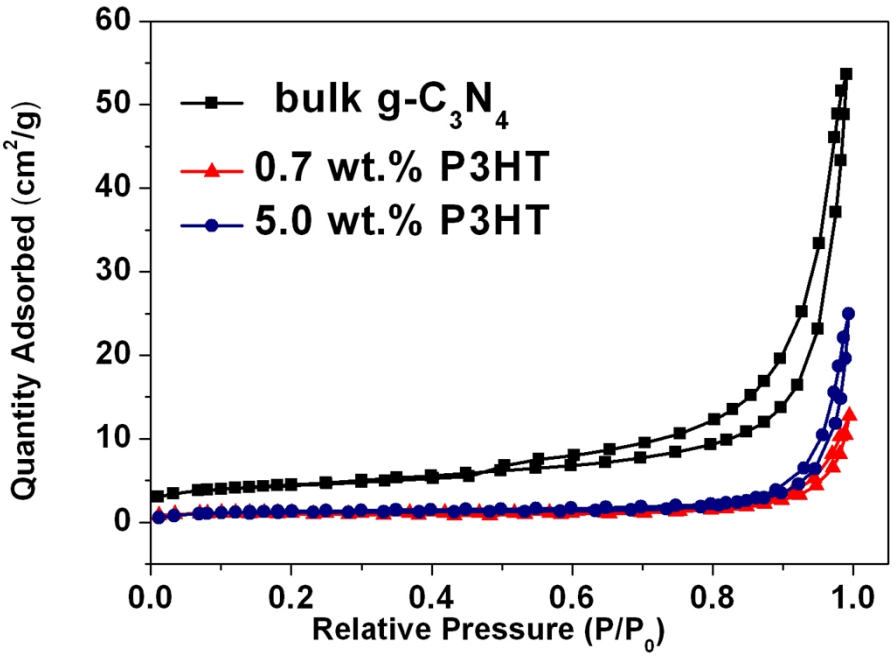

Figure S7. N_2 adsorption-desorption isotherms of the prepared bulk g-C_3N_4, 0.7 wt.% P3HT and 5.0 wt.% P3HT samples.

Reference

S1. F. Dong, Z. W. Zhao, T. Xiong, Z. L. Ni, W. D. Zhang, Y. J. Sun, W. K. Ho. *ACS Appl. Mater. Interfaces* 2013, **5**, 11392-11401.

S2. Y. L. Tian, B. B. Chang, J. L. Lu, J. Fu, F. N. Xi, X. P. Dong. *ACS Appl. Mater. Interfaces* 2013, **5**, 7079-7085.

S3. H. J. Yan, Y. Huang. *Chem. Commun.* 2011, **47**, 4168-4170.

S4. X. J. Bai, R. L. Zong, C. X. Li, D. Liu, Y. F. Liu, Y. F. Zhu. *Applied Catalysis B: Environmental.* 2014, **147**, 82-91.

S5. F. Dong, L. W. Wu, Y. J. Sun, M. Fu, Z. B. Wu, S. C. Lee, *J. Mater. Chem.* 2011, **21**, 15171-15174.

S6. F. Dong, Y. J. Sun, L. W. Wu, M. Fu, Z. B. Wu, *Catal. Sci.Technol.* 2012, **2**, 1332-1335.

S7. F. Dong, Z. Y. Wang, Y. J. Sun, W. K. Ho, H. D. Zhang, *J. Colloid Interface Sci.* 2013, **401**, 70-79.

S8. Y. L. Peng, G. S. Song, X. H. Hu, G. J. He, Z. G. Chen, X. F Xu, J. Q. Hu. *Nanoscale Research Letters*. 2013, **8**, 106-114.