

Supporting Information

Visible light photocatalytic synthesis of H₂O₂ on synergistic phosphorus-doped and defect engineered graphite C₃N₄

Xiankui Xu and Zhonghai Zhang*

Shanghai Key Laboratory of Green Chemistry and Chemical Processes, School of Chemistry and Molecular Engineering, East China Normal University, Dongchuan Road 500, Shanghai 200241, China;
52204300019@stu.ecnu.edu.cn, zhzhang@chem.ecnu.edu.cn.

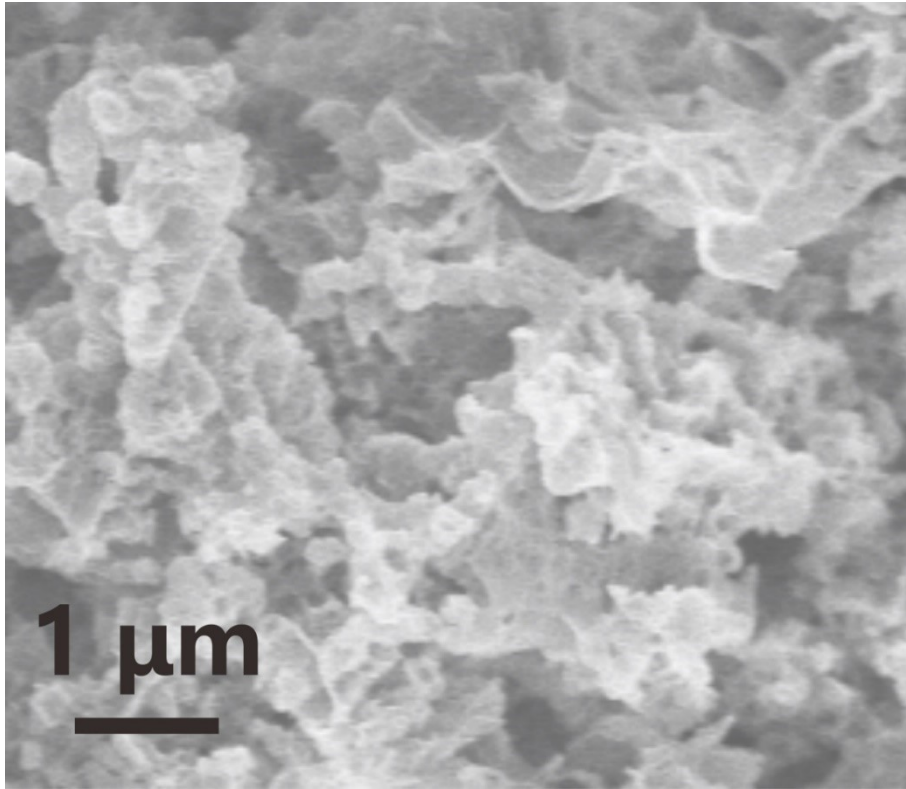


Fig S1 SEM image of C₃N₄.

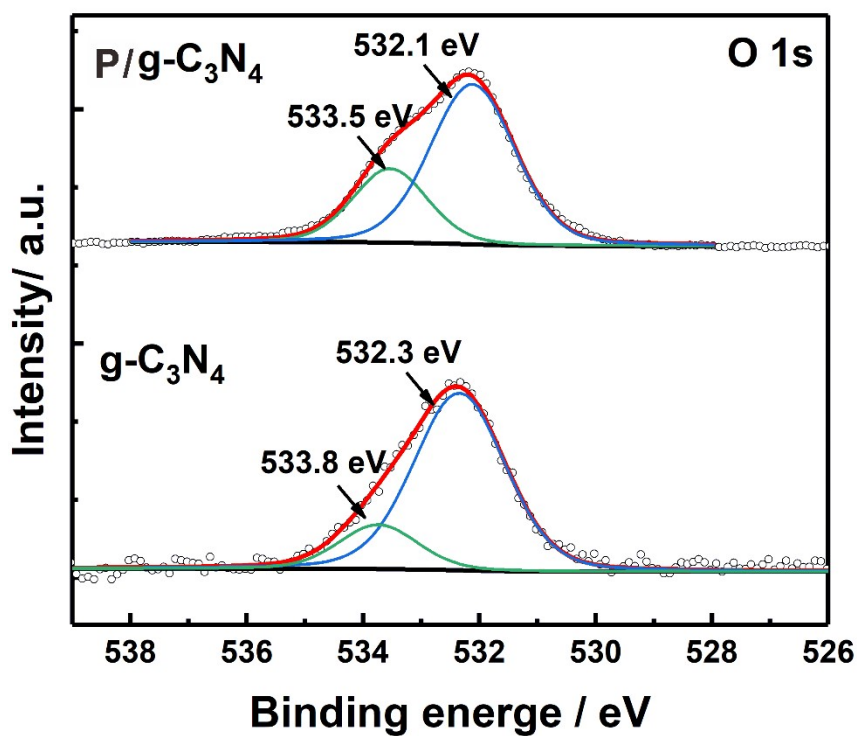


Fig S2 Core-level XPS of O 1s of $g-C_3N_4$ and $P-g-C_3N_4$.

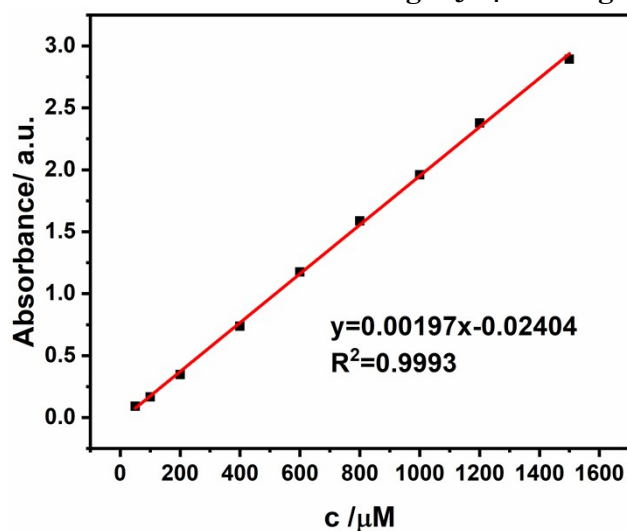


Fig S3 Standard curve of H_2O_2 concentration.

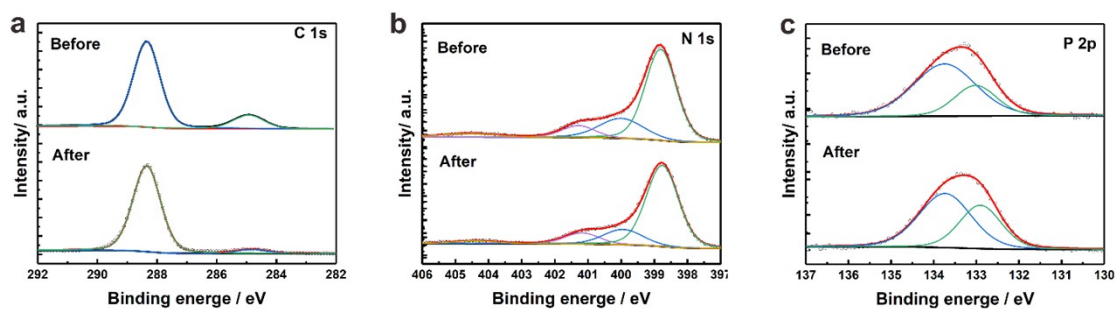


Fig S4 Core-level XPS of (a) C 1s, (b) N 1s, and (c) P 2p of $P/g-C_3N_4$ before and after photocatalytic reactions.

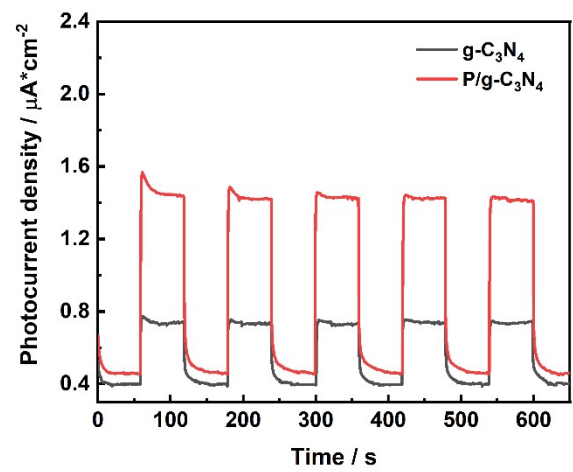


Fig S5 Photocurrent density curves of $\text{g-C}_3\text{N}_4$ and $\text{P/g-C}_3\text{N}_4$.

Table S1 Performance comparison of different photocatalysts for H₂O₂ production

Photocatalyst	Electron donor	Light wavelength	H ₂ O ₂ /mM h ⁻¹	Ref.
Cv-g-C ₃ N ₄	/	≥420 nm	91.3	[35]
IO Cv-g-C ₃ N ₄	Ethanol	≥420 nm	162.9	[36]
C ₃ N ₄ -carbon	2-Propanol	-	317.8	[37]
Nv-g-C ₃ N ₄	Ethanol	> 400 nm	288.9	[38]
Holey g-C ₃ N ₄	2-Propanol	> 420 nm	80	[39]
Reduced g-C ₃ N ₄	/	> 420 nm	170	[40]
K, P, O doped g-C ₃ N ₄	Ethanol	≥420 nm	241.3	[41]
KPF ₆ -modified g-C ₃ N ₄	Ethanol	> 420 nm	312.5	[42]
K, P co-doped g-C ₃ N ₄	Ethanol	≥420 nm	507	[43]
g-C ₃ N ₄ /CNT	Formic acid	≥400 nm	487	[44]
P-g-C ₃ N ₄	Ethanol	≥420 nm	730.11	This