

Electronic Supplementary Information

Thermal Oxidative Etching Method Derived Graphitic C₃N₄: Highly Efficient Metal-free Catalyst in the Selective Epoxidation of Styrene

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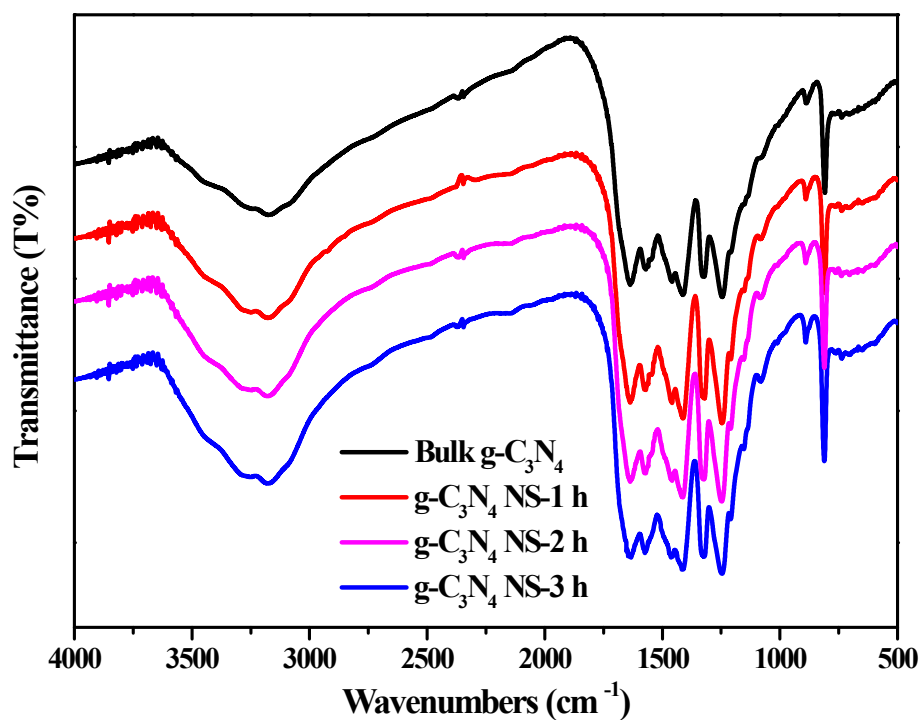


Fig.S1 FTIR spectra of bulk g-C₃N₄, g-C₃N₄ NS-1 h, g-C₃N₄ NS-2 h, and g-C₃N₄ NS-3 h, respectively.

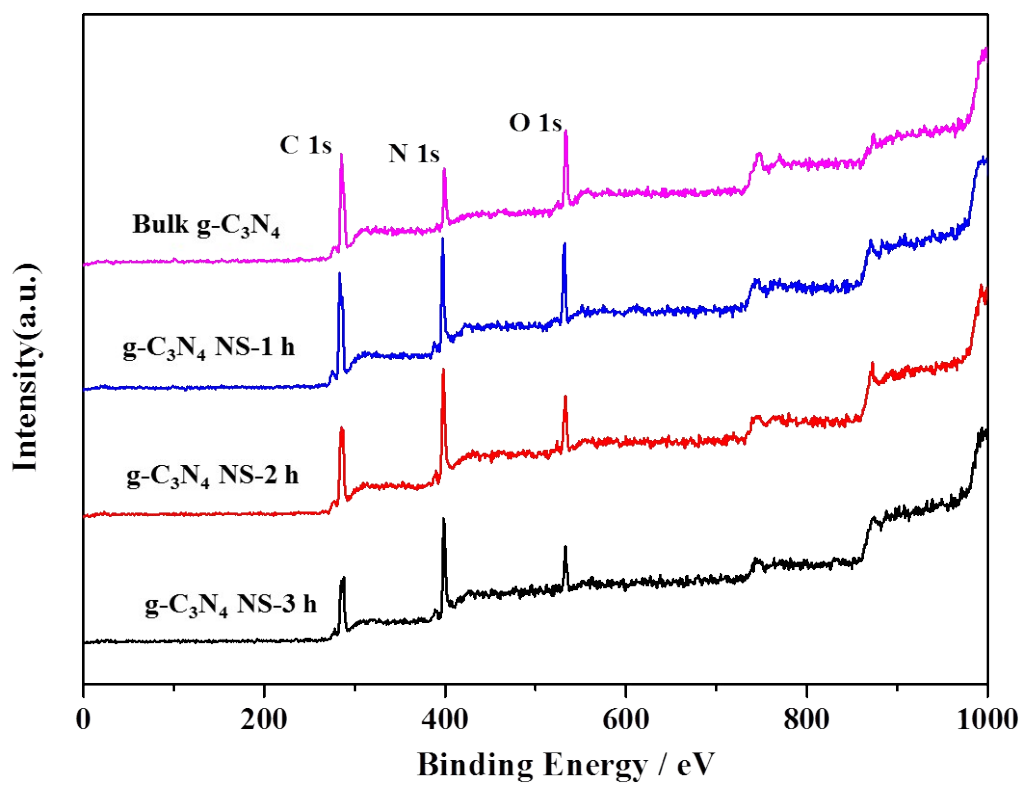


Fig. S2 XPS spectra of samples: survey spectra (a), C 1s spectra (b).

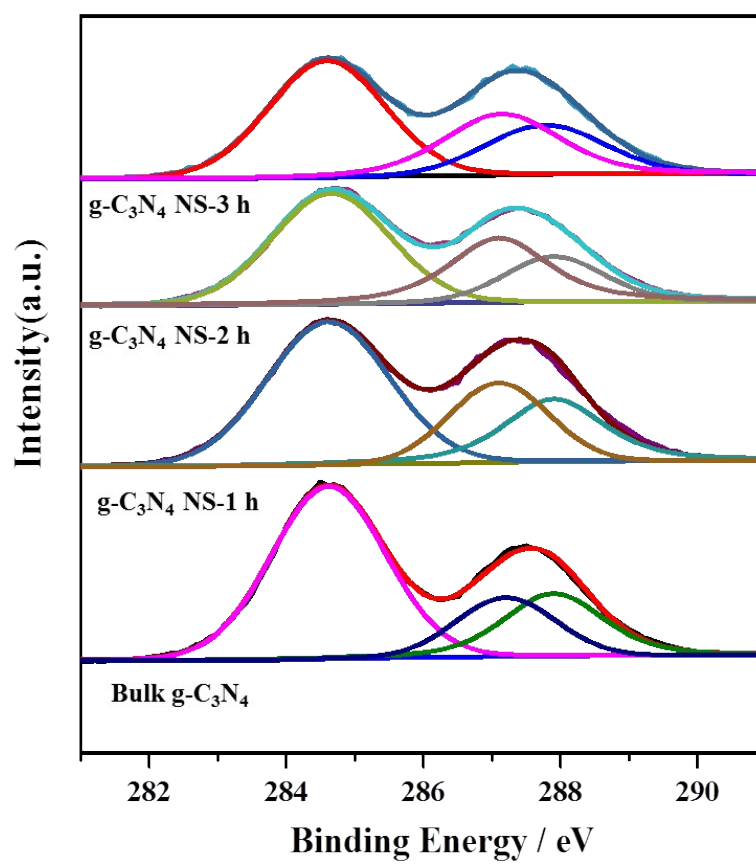


Fig. S3 the XPS C 1s peaks of sample.

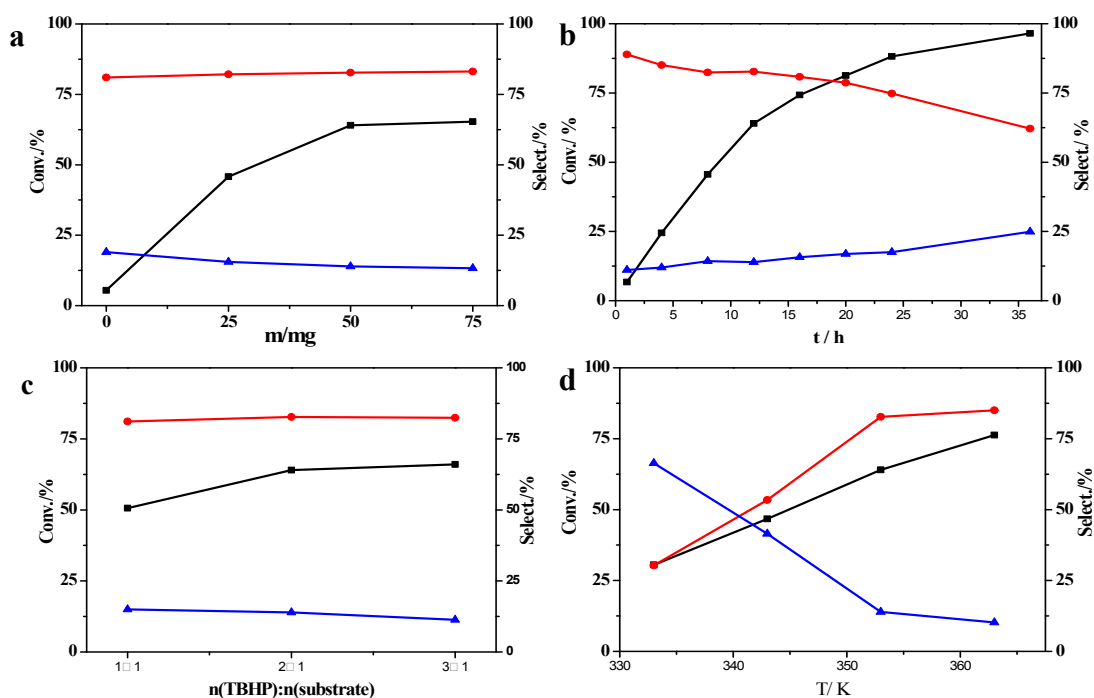


Fig.S4 Catalytic activity and selectivity of g-C₃N₄ NS-2 h on the epoxidation of styrene under different conditions. (a) Effect of the amount of catalyst, 8.7 mmol TBHP (70% aqueous solution) T= 353 K, t=12 h; (b) Effect of the reaction time, catalyst 50 mg, 8.7 mmol TBHP (70% aqueous solution) T= 353 K; (c) Effect of TBHP/styrene molar ratio, catalyst 50 mg, T= 353 K, t=12 h; (d) Effect of reaction temperature, catalyst 50 mg, 8.7 mmol TBHP (70% aqueous solution), t=12 h. Reaction condition: 4.35 mmol styrene, solvent (CH₃CN) = 5 mL. Symbols: black square, conversion of styrene; red dot, selectivity to epoxidation; blue triangle, selectivity to benzaldehyde.

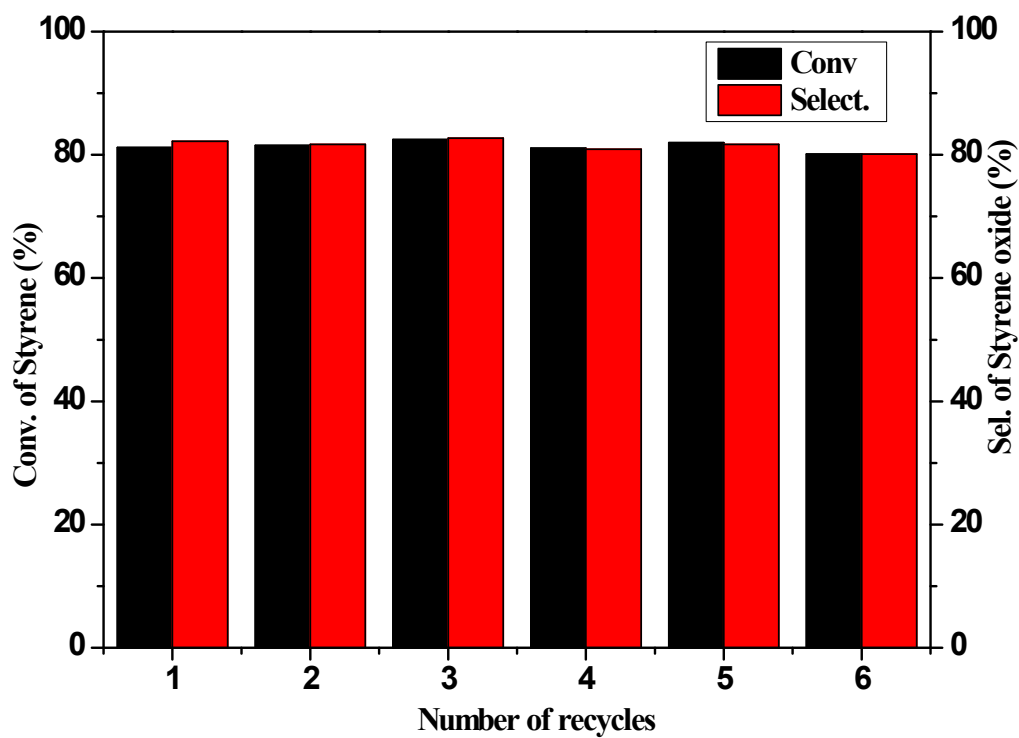


Fig.S5 Recyclability test of g-C₃N₄ NS-3h nanorods for epoxidation of styrene.

^aReaction conditions: 50 mg g-C₃N₄ NS-3h catalyst, 4.35 mmol styrene, 8.7 mmol TBHP (70% aqueous solution), solvent (CH₃CN) = 5 mL, reaction temperature 353 K, t=12h.

Table S1 BET surface areas and pore volume of the sample.

Entry	Catalyst	S _{BET} (m ² g ⁻¹)	pore volume (cm ³ g ⁻¹)
1	Bulk g-C ₃ N ₄	22	0.176
2	g-C ₃ N ₄ NS-1 h	52	0.304
3	g-C ₃ N ₄ NS-2 h	151	0.816
4	g-C ₃ N ₄ NS-3 h	245	1.619