SUPPORTING INFORMATION

Direct Oxidative Amination of the Methyl C-H Bond in N-Heterocycles over Metal-Free Mesoporous Carbon

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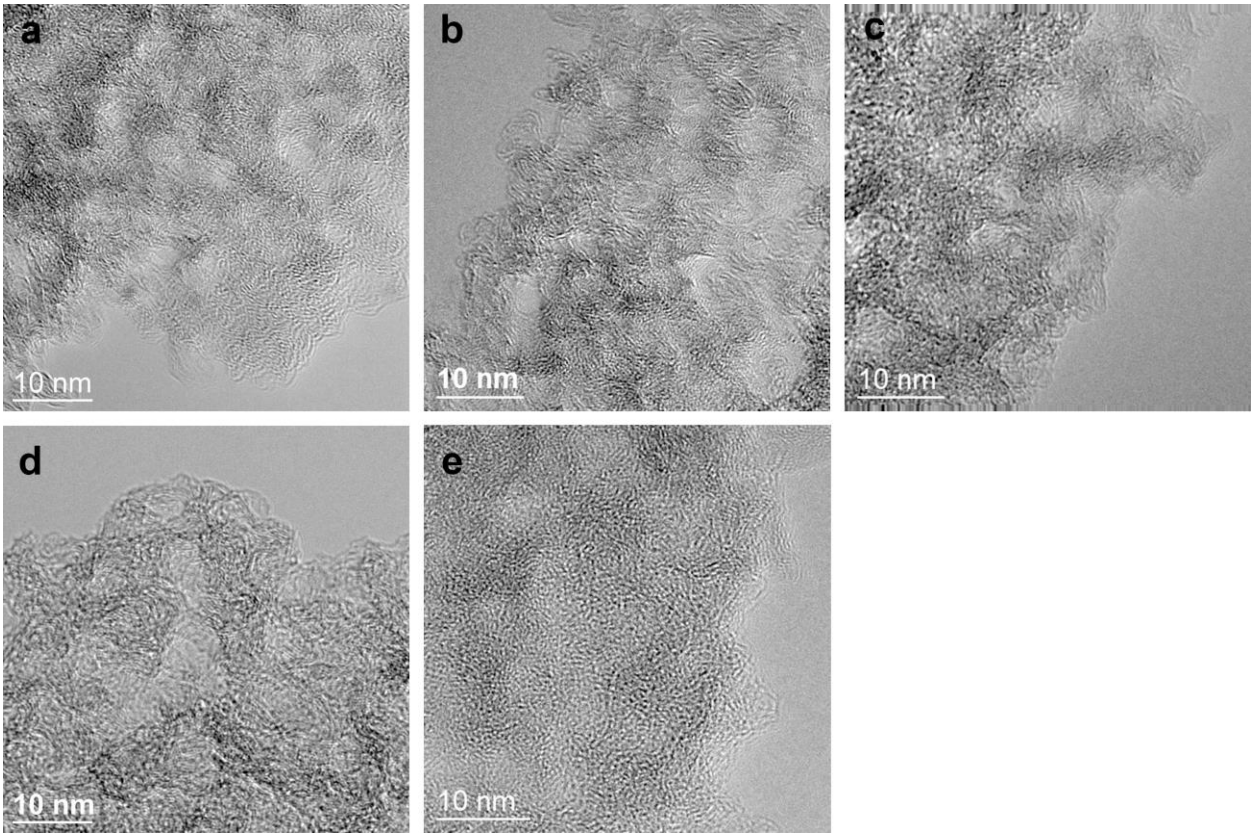


Figure S1. HR-TEM images of C-4 (a), CN_1-4 (b), CN_{10}-4 (c), CP_1-4 (d) and CP_{10}-4 (e).

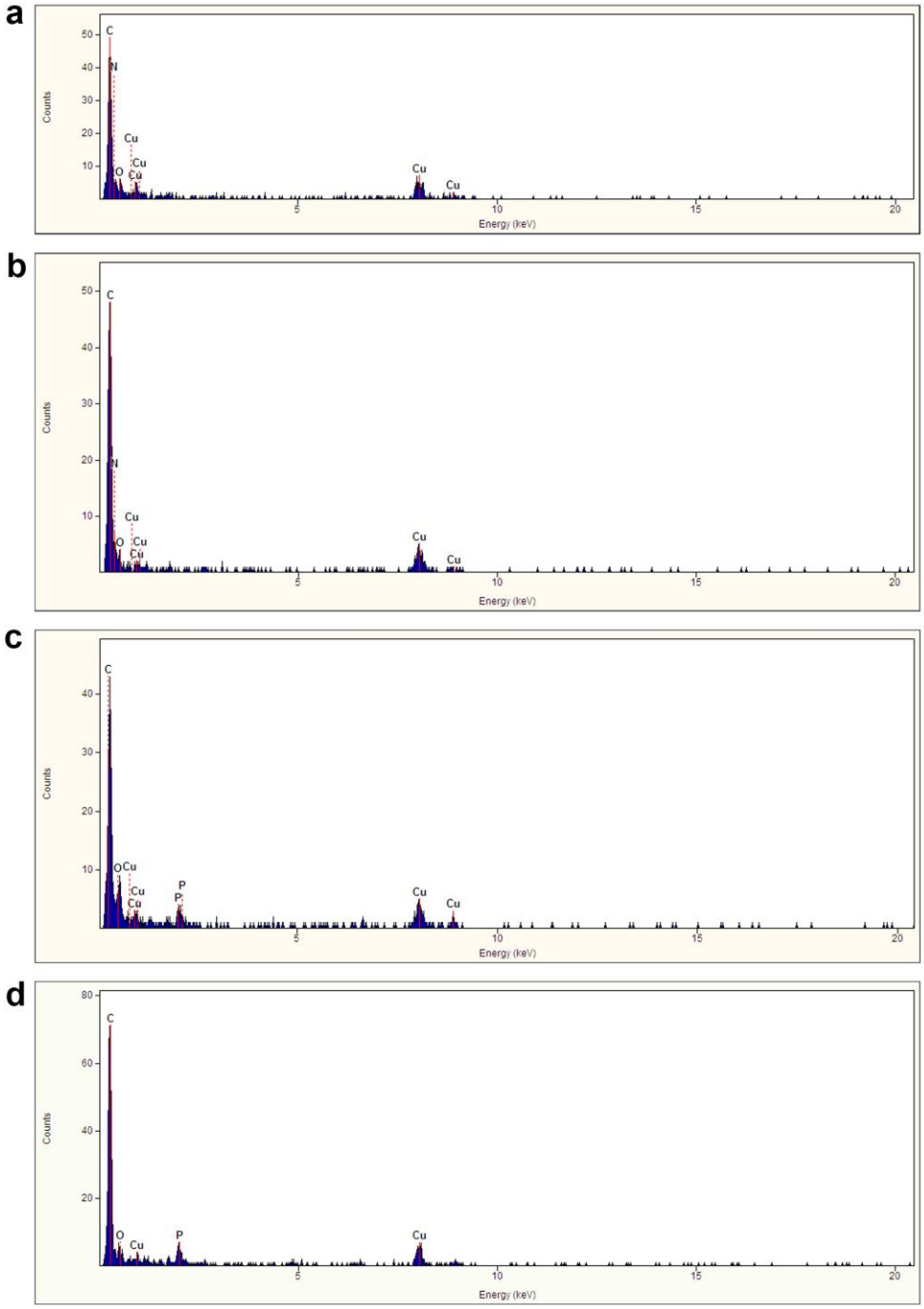


Figure S2. EDS spectra of CN_1-4 (a), CN_{10}-4 (b), CP_1-4 (c) and CP_{10}-4 (d).

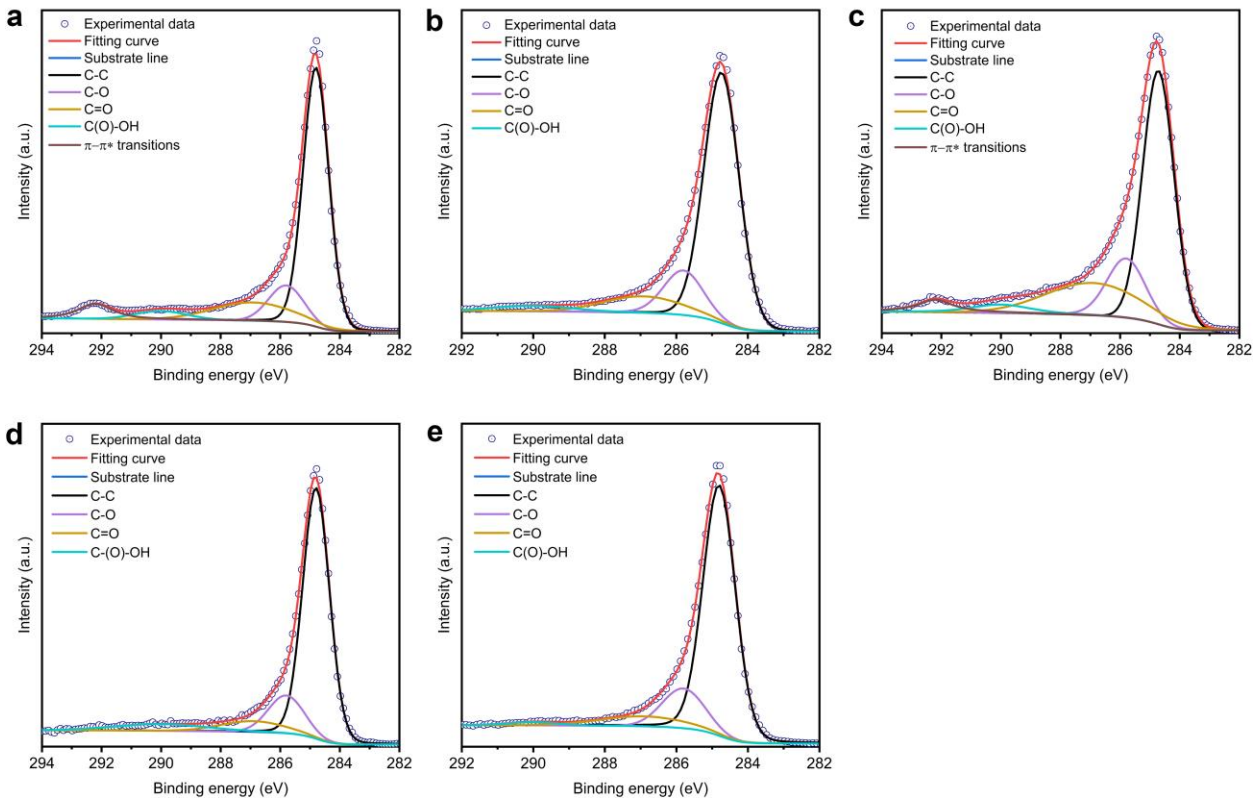


Figure S3. Deconvoluted C 1s XPS spectra of C-4 (a), CN_1-4 (b), CN_{10}-4 (c), CP_1-4 (d) and CP_{10}-4 (e).

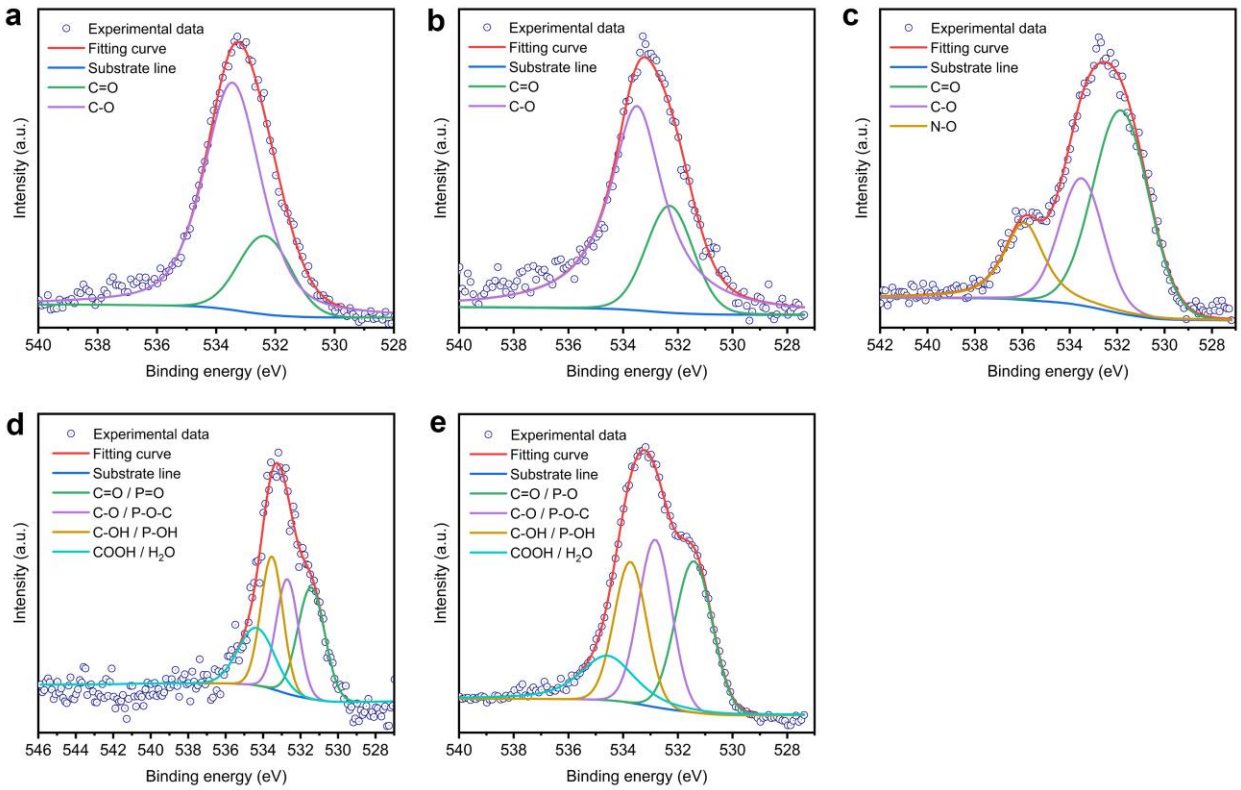


Figure S4. Deconvoluted O 1s XPS spectra of C-4 (a), CN_1-4 (b), CN_{10}-4 (c), CP_1-4 (d) and CP_{10}-4 (e).

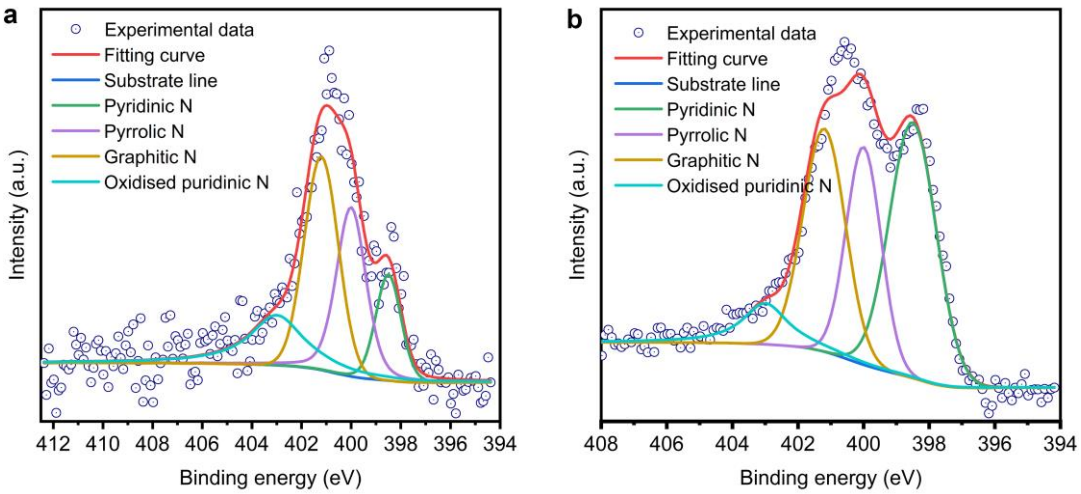


Figure S5. Deconvoluted N 1s XPS spectra of CN_1-4 (a) and CN_{10}-4 (b).

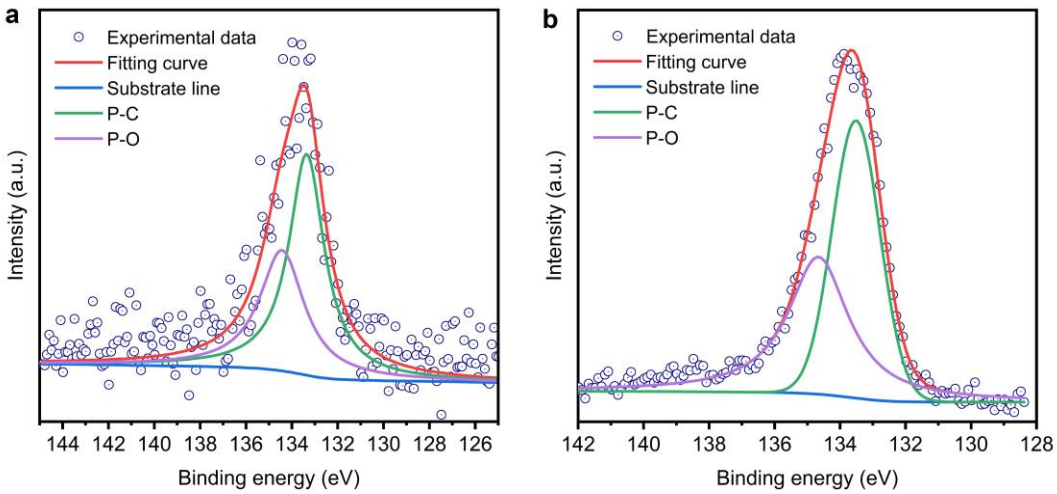


Figure S6. Deconvoluted P 2p XPS spectra of CP_1-4 (a) and CP_{10}-4 (b).

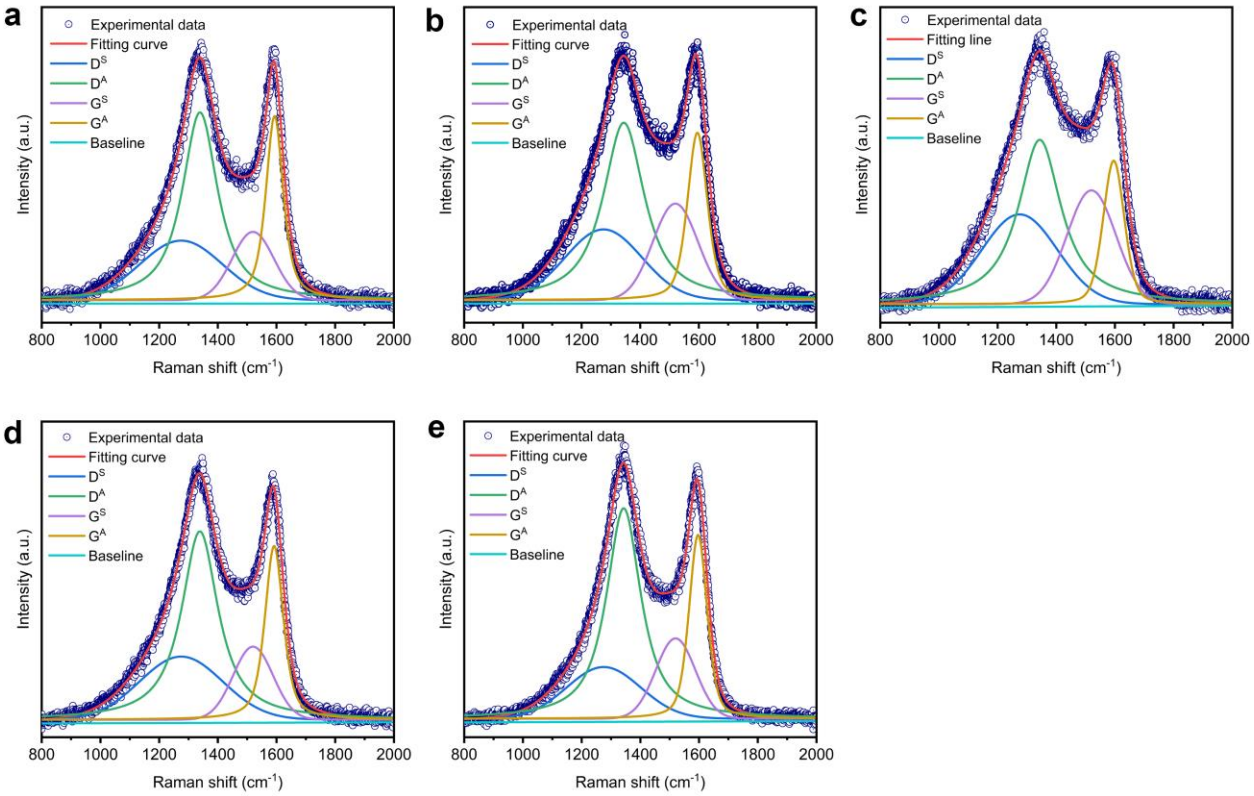


Figure S7. Raman spectra: (a) C-4, (b) CN_1-4, (c) CN_{10}-4, (d) CP_1-4, and (e) CP_{10}-4.

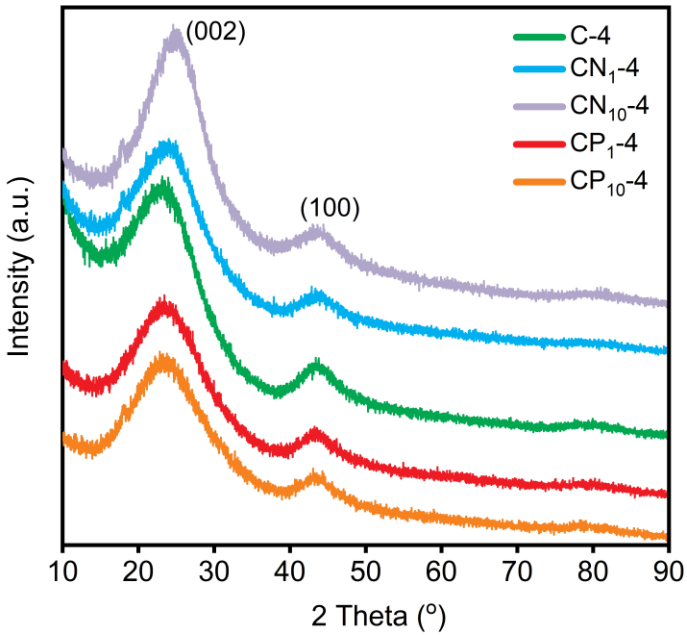


Figure S8. XRD patterns of the porous carbon materials.

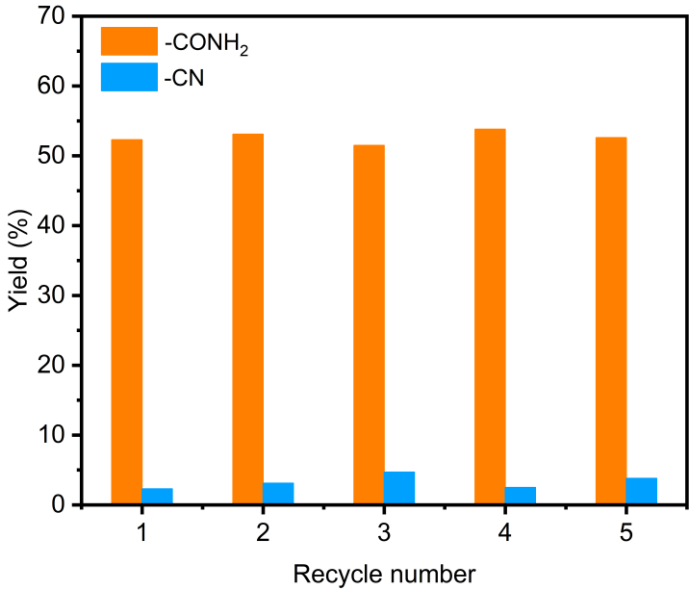


Figure S9. Catalyst reuse study for the oxidative amination of 2-methylpyridine over C-4. Reaction conditions: 2 mL 2-methylpyridine, H_2O (0.5 g), nitrogen source (amount of nitrogen: 2 mmol), 100 mg C-4, 2 MPa O_2, 140 ^oC, 2.5 hours. Yields were determined by GC using biphenyl as an internal standard and based on the amount of N in nitrogen source.

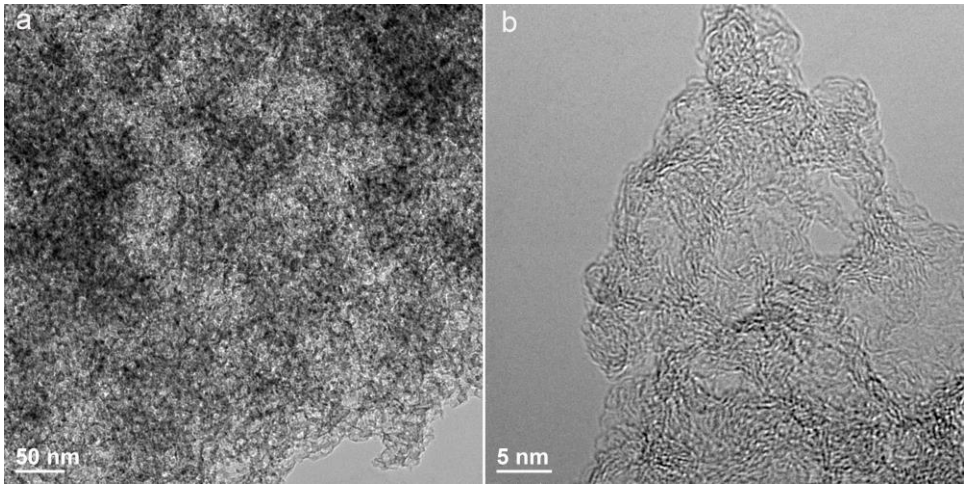
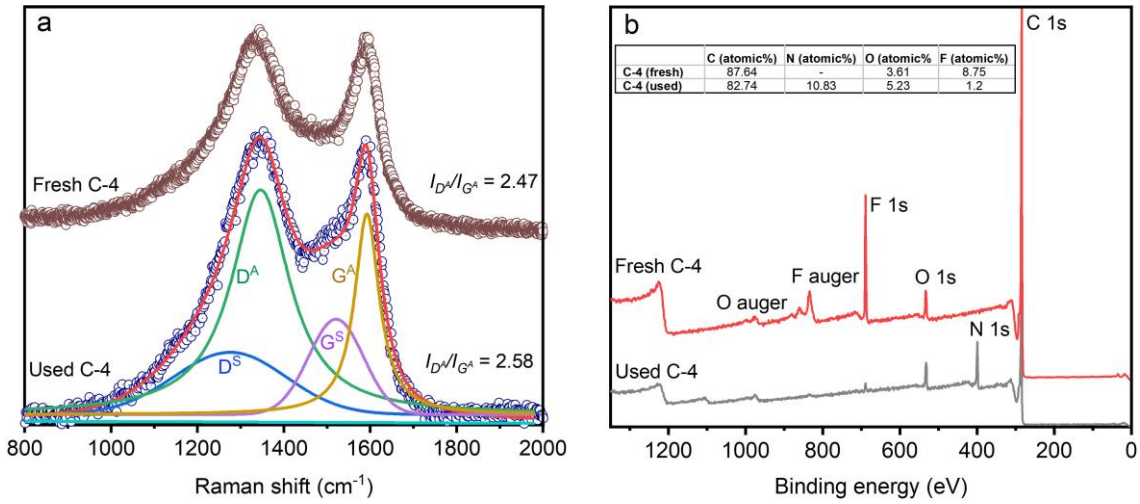


Figure S10. TEM (a) and HR-TEM (b) images of the used C-4.



	C (atomic%)	N (atomic%)	O (atomic%	F (atomic%)
C-4 (fresh)	87.64	-	3.61	8.75
C-4 (used)	82.74	10.83	5.23	1.2

Figure S11. Raman spectra (a) and XPS patterns (b) of the fresh C-4 and used C-4, and the elemental compositions of catalysts are shown as the inset table in Figure (b).

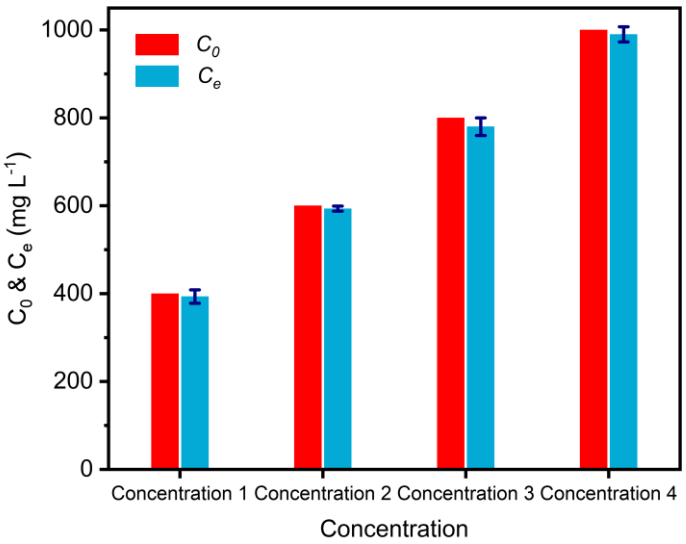


Figure S12. Liquid-phase adsorption experiments of toluene over C-4. C_0, initial concentration of toluene. C_e, equilibrium concentration of toluene.

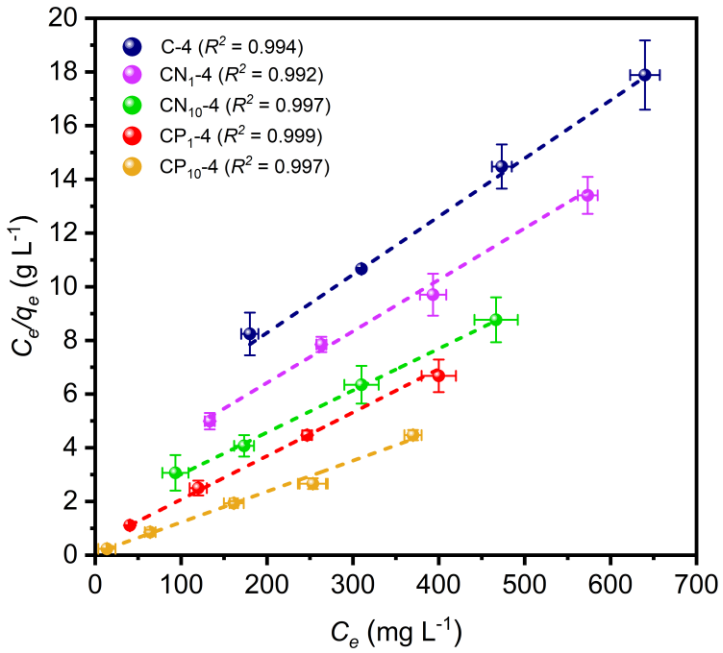


Figure S13. Langmuir adsorption isotherms of the porous carbon catalysts for 2-methylpyridine.

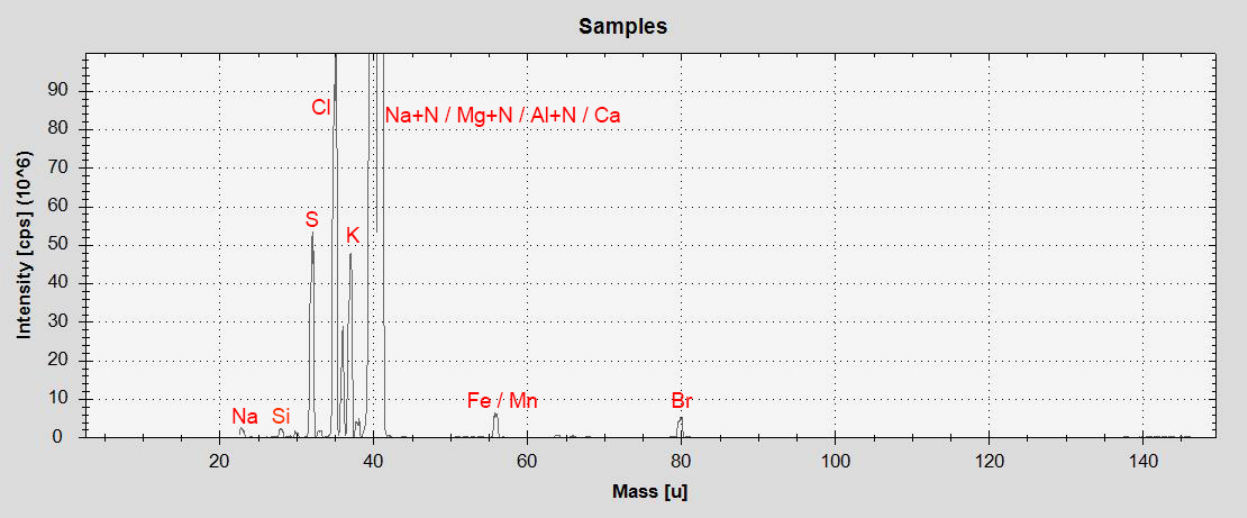


Figure S14. ICP-MS survey scan of C-4.

Table S1. Fitting results of Raman spectra.

sample	D^S (Gauss)			D^A (Lorentz)			G^S (Gauss)			G^A (Lorentz)			I_D^A/I_G^A
	center (cm^{-1})	FWHM[a] (cm^{-1})	area (%)	center (cm^{-1})	FWHM (cm^{-1})	area (%)	center (cm^{-1})	FWHM (cm^{-1})	area (%)	center (cm^{-1})	FWHM (cm^{-1})	area (%)	
C-4	1275	332.5	20.0	1339	149.4	48.4	1520	163.8	12.0	1593	71.1	19.6	2.47
CN_1-4	1275	303.8	20.0	1344	173.1	46.8	1520	180.8	17.1	1595	80.2	16.1	2.90
CN_{10}-4	1275	301.7	24.9	1344	178.1	41.2	1520	197.1	21.0	1596	85.1	12.9	3.18
CP_1-4	1275	332.6	22.4	1339	150.7	45.6	1520	155.1	11.1	1591	70.8	20.9	2.19
CP_{10}-4	1275	282.6	19.8	1342	130.9	43.1	1520	194.3	17.1	1595	65.5	20.0	2.15
C-4-used	1275	301.6	17.3	1344	163.9	50.0	1520	152.2	13.4	1593	70.9	19.3	2.58

[a]Full width at half-maximum