

Supporting Information

Mesoporous Nitrogen-Doped Carbon for Copper-Mediated Ullmann-type C-O/-N/-S Cross-Coupling Reactions

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Figures and Tables

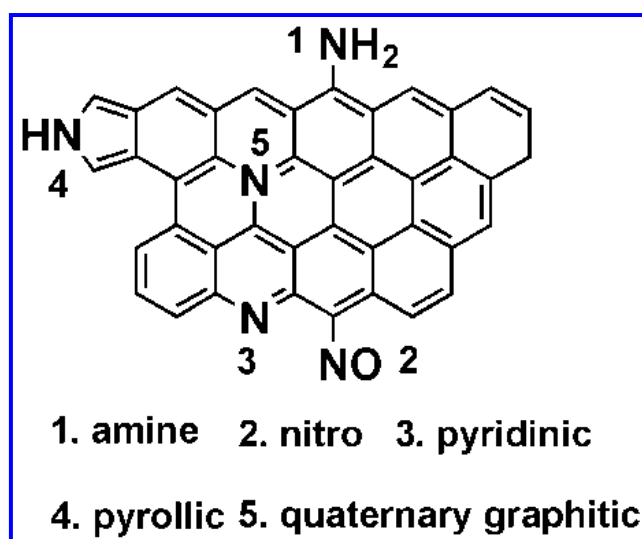


Figure S1. Different chemical environment of the doped nitrogen atoms in the nitrogen-doped carbon materials

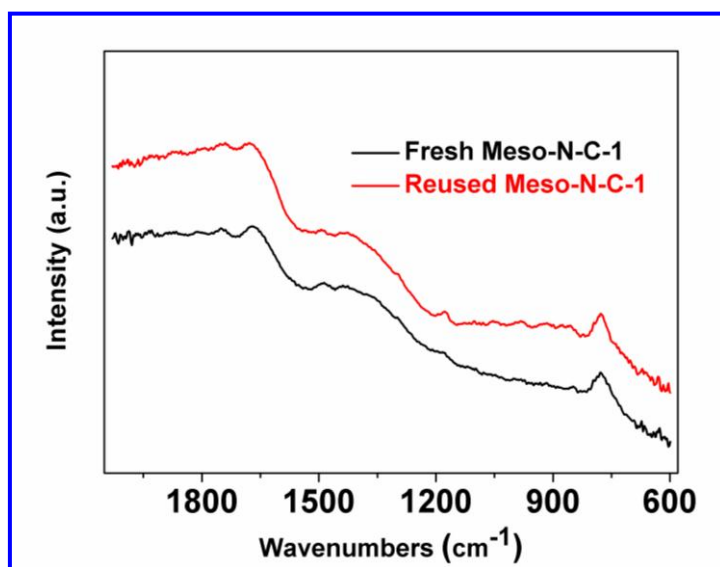


Figure S2. FT-IR spectra of Meso-N-C-1 (fresh and reused)

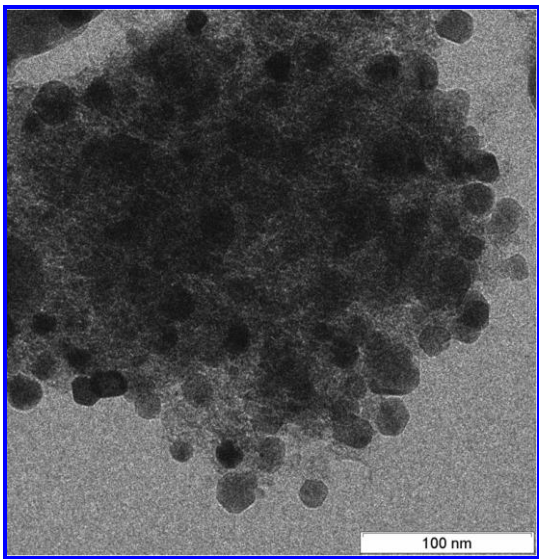


Figure S3. The TEM image of (CuO)_{1.0}@Meso-N-C.
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Table S1. Texture properties and elemental compositions of the prepared nitrogen-doped carbon materials. ^a

Catalyst	Specific surface area (m ² /g)	Pore Size (nm)	Mesoporous volume (cm ³ /g)	Elemental analysis (wt.%)		
				N	C	H
Meso-N-C-1	1062	4.8	2.08	12.9	74.5	1.3
Meso-N-C-2	831	4.7	1.91	4.4	63.1	3.7
Meso-N-C-3	427	1.7	0.91	7.8	84.2	1.7

^a Specific surface area from Brunauer-Emmett-Teller (BET) method, Pore size and mesoporous volume from Barrett-Joyner-Halenda (BJH) method.

Table S2. Texture properties of the copper-containing nitrogen-doped carbon materials.

Catalyst	Specific surface area (m ² /g)	Pore Size (nm)	Mesoporous volume (cm ³ /g)
CuO _{1.0} @Meso-N-C	373	4.4	0.64
CuO _{0.5} @Meso-N-C	488	3.7	0.88
CuO _{0.2} @Meso-N-C	484	4.8	0.93

^a Specific surface area from Brunauer-Emmett-Teller (BET) method, Pore size and mesoporous volume from Barrett-Joyner-Halenda (BJH) method.

Characterization data for the isolated compounds

Diphenyl ether (Table 1, Entry 13): Colorless oil. Isolated yield: 77%. ¹H NMR (CDCl₃): δ = 7.33 (m, *J* = 7.89 Hz, 4H), 7.09 (t, *J* = 7.89 Hz, 2H), 7.01 (d, *J* = 8.25 Hz, 4H). ESI-MS: [M+H⁺] 170.8.

4-Methylphenyl phenyl ether (Table 2, Entry 5): Colorless oil. Isolated yield: 87%. ¹H-NMR (CDCl₃): δ = 2.32 (s, 3H), 6.86-6.91 (m, 2H), 6.95-6.98 (m, 2H), 7.03-7.07 (m, 1H), 7.10-7.14 (m, 2H), 7.27-7.33 (m, 2H). ESI-MS: [M+H⁺] 185.2

Diphenylamine (Table 2, Entry 13): White solid. Isolated yield: 65%. ¹H NMR (CDCl₃): δ = 7.24-7.28 (m, 4H), 7.04-7.09 (d, *J* = 7.2 Hz, 4H), 6.93 (m, 2H). ESI-MS: [M+H⁺] 169.7.

Diphenylsulfide (Table 2, Entry 15): Colorless oil. Isolated yield: 90%. ¹H NMR (CDCl₃): δ = 7.38-7.41 (m, 4H), 7.31-7.35 (m, 4H), 7.26-7.28 (m, 2H). ESI-MS: [M+H⁺] 186.9.