Supporting Information

Facile and template-free synthesis of porous carbon modified with FeO_x for transfer hydrogenation of nitroarenes

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Materials. Nitrobenzene (99%), hydrazine hydrate (85%) and ethanol were supplied by China Medicine Group Shanghai Chemical Reagent Company. Nitrotoluene (99%), 4-ethylnitrobenzene (99%), 4-nitroanisole (98%), 4-nitroaniline (99%), m-dinitrobezene (99%), 4-nitrophenol (99%), 2-nitrophenol (99%), 2-nitrobenzyl alcohol (98%), 4-nitrochlorobenzene (99.5%), 4-nitroiodobenzene (98%), 1-Bromo-4-nitrobenzene (99%), 2-nitrofluorene (98%), 8-nitroquinoline (98%), 5-nitroindole (98%) and sodium citrate dihydrate (99%) were purchased from Aladdin Reagent Co. Ltd., Shanghai, China. Ferric citrate pentahydrate (99%) was bought from Xiya Reagent Research Center. All the chemicals were used without further purification.
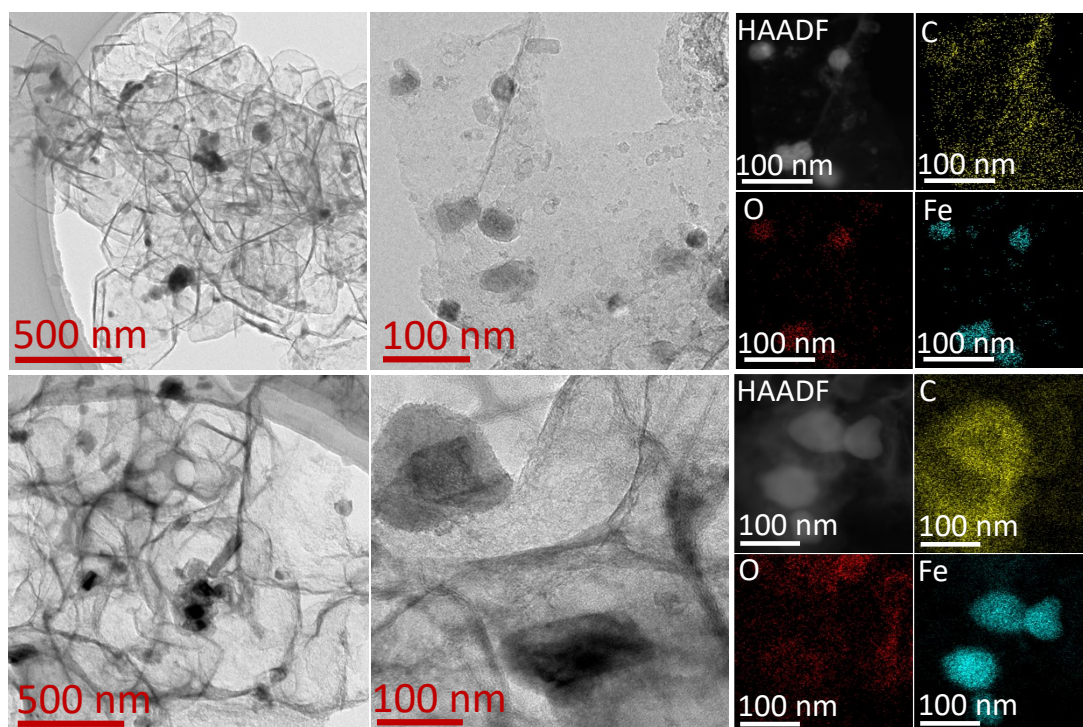
Fig. S1 TEM and HAADF image combined with elemental mapping of FeC600 (top) and FeC800 (bottom)

Table S1. The specific surface area, pore volume and diameter of each catalyst

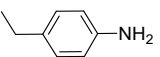| Sample	S_{BET} (m^2/g)	S_{micro} (m^2/g)	V_{total} (cm^3/g)	V_{micro} (cm^3/g)
FeC600	256.1±5.3	117.4	0.1172	0.0606
FeC700	364.1±8.5	185.0	0.1725	0.0991
FeC800	261.1±2.4	25.2	0.1083	0.0122

Table S2. The surface of content of each element detected by XPS
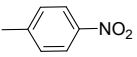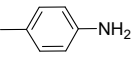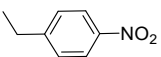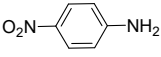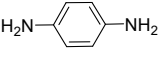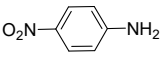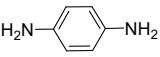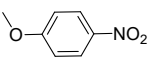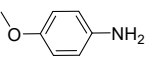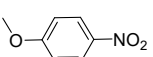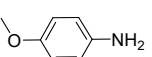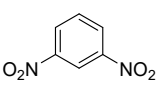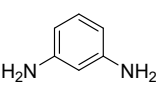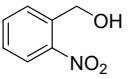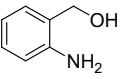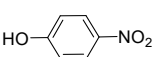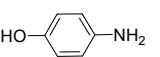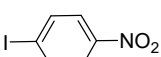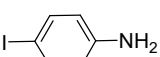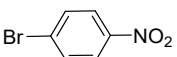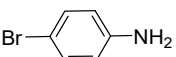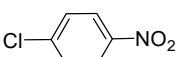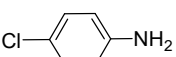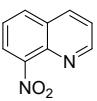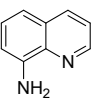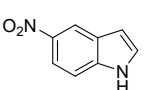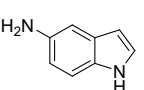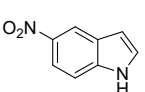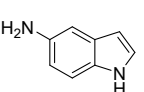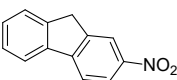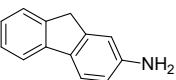
Sample	C (at%)	O (at%)	Fe (at%)
FeC600	91.42	7.20	1.37
FeC700	88.84	9.28	1.87
FeC800	88.86	9.88	1.26

Table S3 The performance of different materials for the transfer hydrogenation of

nitrobenzene

Catalyst	Catalyst loading (mg)	Substrate dosage (mmol)	Hydrazine dosage (mmol)	Temperature (oC)	Time	Yield (%)	Ref.
Rh/Fe$_3$O$_4$/g-C$_3$N$_4$-N	13	1	3	110	6min	＞99	[1]
SBA-15@Pr-NH$_2$/MF-Pd(0)	3.8	1	3	80	30min	97	[2]
MoS$_2$@C	10	10	40	80	1h	99	[3]
CeO$_2$	30	2	12	80	8h	93	[4]
MoOxNy-550 (2 : 1)	20	0.5	0.75	30	50min	＞99	[5]
Co@NC	10	1	400μL	80	30min	97	[6]
FeSA@NC-20A	10	1	3	rt	30min	99	[7]
Fe/Fe3C@NC750	20	1	4	60	1h	100	[8]
Fe–phenanthroline/C	1 mol% Fe	0.5	2	100	15h	99	[9]
Fe$_3$O$_4$/Pectin/Au	0.2 mol%	1	3	90	1h	98	[10]
ImmFe-IL	3 mol%	1	3	110	12h	98	[11]
Ni-WC	10	0.5	400μL	60	30min	99	[12]
Rh	1 mol%	0.5	1	80	2.5h	99	[13]
Fe-500-1h	0.025mmol	1	4	85	1h	100	[14]
FeC700	5	3	4 equiva.	100	1h	83	This work

Table S4. The reduction of nitroarenes with different substituents over FeC700

Entry	Substrate	Product	Conv. (%)	Sel. (%)
1[a]	—⟨⟩—NO$_2$	—⟨⟩—NH$_2$	99	99
2[a]	⟨⟩—NO$_2$	⟨⟩—NH$_2$	99	99
3[a]	O$_2$N—⟨⟩—NH$_2$	H$_2$N—⟨⟩—NH$_2$	69.3	99
4[b]	O$_2$N—⟨⟩—NH$_2$	H$_2$N—⟨⟩—NH$_2$	94.9	99
5[a]	O—⟨⟩—NO$_2$	O—⟨⟩—NH$_2$	62.1	95.9
6[b]	O—⟨⟩—NO$_2$	O—⟨⟩—NH$_2$	99	96.5
7[c]	O$_2$N—⟨⟩—NO$_2$	H$_2$N—⟨⟩—NH$_2$	99	99
8[a]	⟨⟩ CH$_2$OH, NO$_2$	⟨⟩ CH$_2$OH, NH$_2$	99	99
9[b]	⟨⟩ OH, NO$_2$	⟨⟩ OH, NH$_2$	99	98.8
10[b]	HO—⟨⟩—NO$_2$	HO—⟨⟩—NH$_2$	99	98.6
11[d]	I—⟨⟩—NO$_2$	I—⟨⟩—NH$_2$	99	99
12[d]	Br—⟨⟩—NO$_2$	Br—⟨⟩—NH$_2$	99	91.8
13[e]	Cl—⟨⟩—NO$_2$	Cl—⟨⟩—NH$_2$	95.7	93.8
14[f]	quinoline-NO$_2$	quinoline-NH$_2$	99	99
15[f]	O$_2$N—indole	H$_2$N—indole	88.5	98.4
16[g]	O$_2$N—indole	H$_2$N—indole	99	95.9
17[g]	fluorene-NO$_2$	fluorene-NH$_2$	99	99

[a] 3mg FeC700, 1mmol substrate, 6mmol hydrazine hydrate (85%), 1mL ethanol, 100ºC, 3h.

[b] 3mg FeC700, 1mmol substrate, 6mmol hydrazine hydrate (85%), 1mL ethanol,

110°C, 3h.

[c] 3mg FeC700, 1mmol substrate, 12mmol hydrazine hydrate (85%), 1mL ethanol, 100°C, 3h.

[d] 3mg FeC700, 1mmol substrate, 6mmol hydrazine hydrate (85%), 1mL ethanol, 90°C, 3h.

[e] 3mg FeC700, 1mmol substrate, 6mmol hydrazine hydrate (85%), 1mL ethanol, 80°C, 3h.

[f] 3mg FeC700, 0.5mmol substrate, 3mmol hydrazine hydrate (85%), 1mL ethanol, 100°C, 3h.

[g] 3mg FeC700, 0.5mmol substrate, 3mmol hydrazine hydrate (85%), 1mL ethanol, 110°C, 3h.

Reference

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