Supplementary data

for

Fenton-like degradation of bisphenol A by Fe_3O_4 rhombic dodecahedrons

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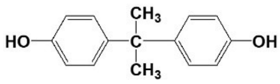
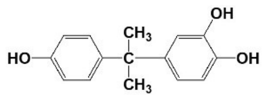
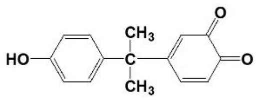
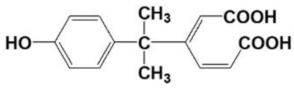
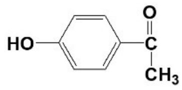
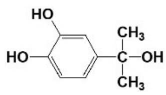
Table S1 Basic properties of Fe_3O_4-R before and after reaction in the cycle experiments.

Samples	BET surface area (m^2 g^{-1})	Pore Volume (cm^3 g^{-1})	Pore size (nm)	Surface Fe(II)/Fe(III) ratio
Fresh Fe_3O_4-R	19.99	0.041	2.12	63.51%
Used Fe_3O_4-R	18.56	0.035	1.65	50.53%

Table S2 Comparison of Fe_3O_4-R with other Fe_3O_4 catalysts in references.

Catalysts	Catalyst dosage (g L^{-1})	H_2O_2 dosage (mM)	Pollutant concentration (mM)	Initial pH	Removal efficiency	Ref.
Superparamagnetic Fe_3O_4	5	1.2	phenol (1)	6.0-7.0	60% (6 h)	1
Fe_3O_4 nanoparticles	1.0	12	2,4-dichlorophenol (0.61)	3.0	51% (180 min)	2
Nano-Fe_3O_4	1.0	0.05	4-chlorocatechol (10^{-3})	6.5	100% (3 h)	3
Nano-sized Fe_3O_4	0.25	40	phenol (6.38)	4.0	98% (90 min)	4
Nanosized Fe_3O_4	0.5	UV-Fenton (11.8)	catechol (0.9)	3.0	84% (240 min)	5
magnetite	0.2	UVA-Fenton (1)	phenol (0.1)	3.0	100% (4 h)	6
Fe_3O_4 magnetic nanoparticles	0.585	Sono-Fenton (160)	BPA (0.09)	3.0	100% (500 min)	7
Fe_3O_4-R	0.1	0.2	BPA (0.1)	5.0	100% (30 min)	This work

Table S3 LC/MS intermediates obtained during Fenton-like degradation of BPA using Fe_3O_4-R.

Product	Experimental mass [M-H]+ m/z	RT	Molecular Formula	Tentative structure
BPA	227.1045	2.64	$C_{15}H_{16}O_2$	
TP243	243.0993	2.01	$C_{15}H_{16}O_3$	
TP241	241.0838	1.70	$C_{15}H_{14}O_3$	
TP275	275.0477	1.36	$C_{15}H_{16}O_5$	
TP135	135.0424	1.42	$C_8H_8O_2$	
TP167	167.0683	1.35	$C_9H_{12}O_3$	

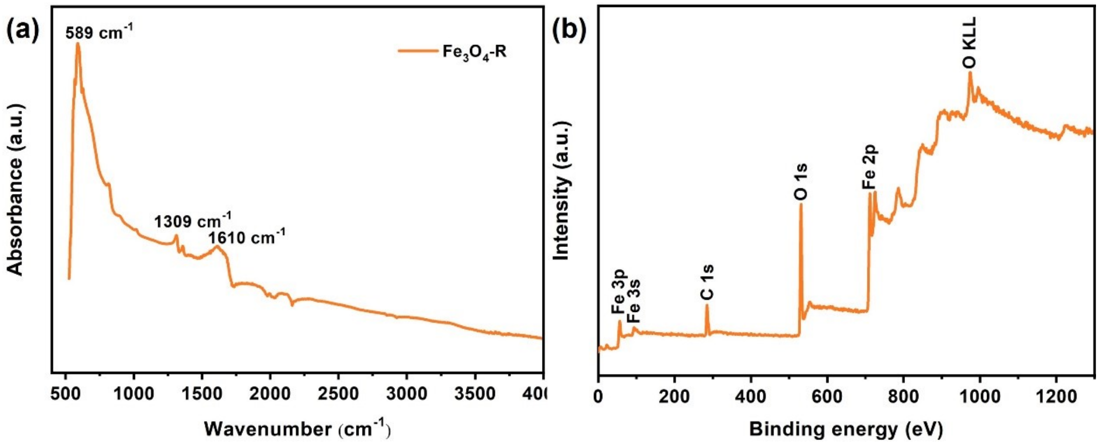


Fig. S1 (a) FTIR spectrum and (b) XPS spectrum of Fe_3O_4-R.

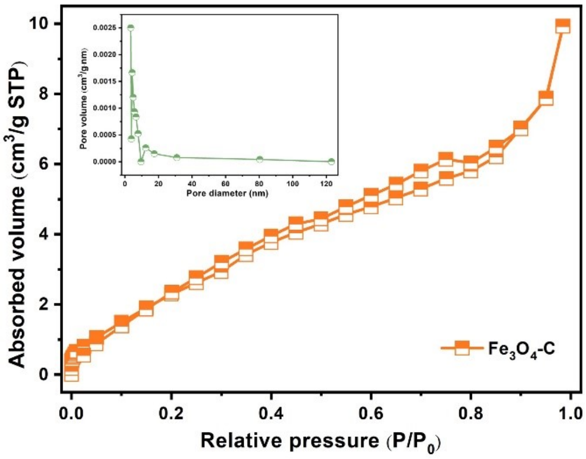


Fig. S2 Nitrogen adsorption-desorption isotherm and its pore size distribution (inset) of Fe_3O_4-C.

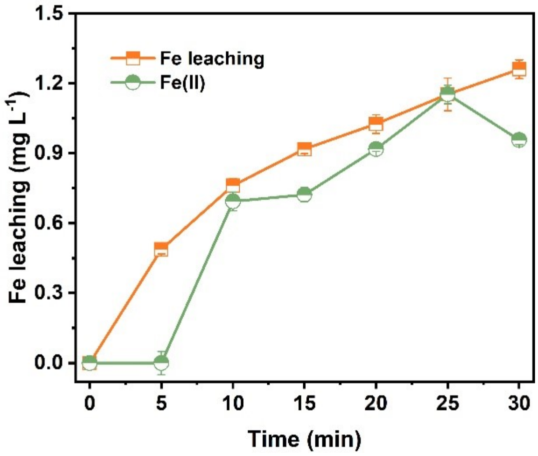


Fig. S3 The concentration of Fe leaching and Fe(II) in the Fe_3O_4-R/H_2O_2 system. Conditions: $[catalyst]_0 = 0.1$ g L^{-1}, $[H_2O_2]_0 = 5$ mM, $[BPA]_0 = 0.1$ mM, and initial pH = 5.0.

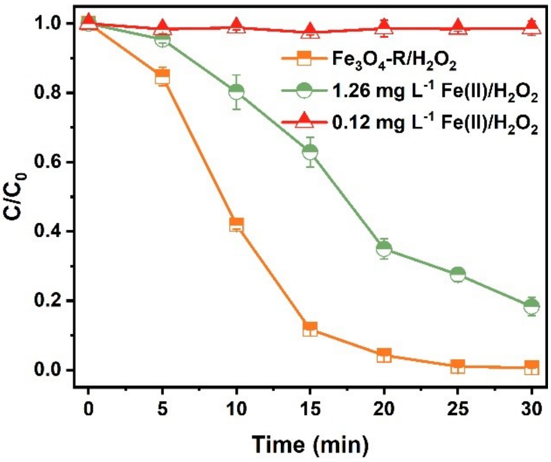


Fig. S4 Estimated contribution of homogeneous and heterogeneous systems to the BPA degradation in the Fe_3O_4-R/H_2O_2 system. Conditions: $[\text{catalyst}]_0$ = 0.1 g L^{-1}, $[H_2O_2]_0$ = 5 mM, $[\text{BPA}]_0$ = 0.1 mM, and initial pH = 5.0.

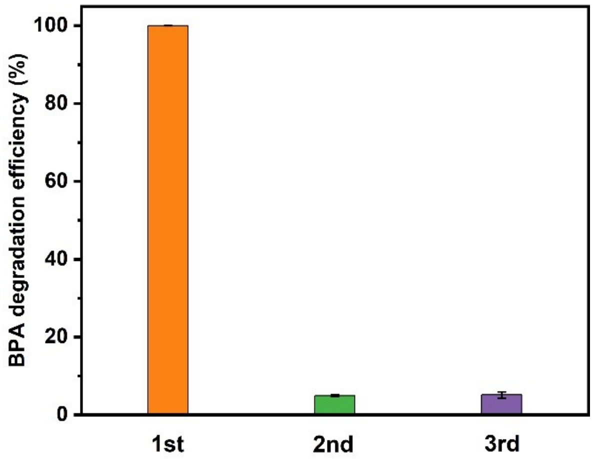


Fig. S5 Reuse performance of Fe_3O_4-R for Fenton-like degradation of BPA. Conditions: $[catalyst]_0 = 0.1$ g L^{-1}, $[H_2O_2]_0 = 5$ mM, $[BPA]_0 = 0.1$ mM, and initial pH = 5.0.

Reference

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