Supporting Information For

Amorphous Fe^{2+}-rich FeO_x loaded in mesoporous silica as a highly efficient heterogeneous Fenton catalyst

Min Wang[a], Zhu Shu[b], Lingxia Zhang[a,*], Xiangqian Fan[a], Guiju Tao[a], Yongxia Wang[a], Lisong Chen[a], Meiying Wu[a], Jianlin Shi[a,*]

[a] State Key Laboratory of High Performance Ceramics and Superfine Microstructure, Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 Dingxi Road, Shanghai 200050, PR China

[b] Faculty of Material Science and Chemistry, China University of Geosciences, Wuhan 430074, PR China

Table S1.

Pore structural parameters and Fe content of the prepared FeO_x/SBA -15 catalysts.

Samples	S_{BET} ($m^2 \cdot g^{-1}$)	d_{BJH} (nm)	Pore volume ($cm^3 \cdot g^{-1}$)	Fe%
SBA-15	704.3	6.78	0.98	0
FeO_x/SBA-9h-450	472.5	6.19	0.82	8.344
FeO_x/SBA-17h-450	313.9	4.90	0.43	13.832
FeO_x/SBA-27h-450	296.9	4.43	0.36	14.217
FeO_x/SBA-36h-450	260.7	3.84	0.19	16.387
FeO_x/SBA-48h-450	240.6	3.79	0.16	16.938
FeO_x/SBA-17h-400	290.5	4.40	0.38	12.089
FeO_x/SBA-17h-500	418.7	5.87	0.63	13.762
FeO_x/SBA-17h-550	394.4	5.48	0.54	12.663
FeO_x/SBA-17h-600	349.9	4.99	0.48	15.484

Table S2.

XPS of Fe 2p in FeO_x/SBA -15 catalysts

Samples	FeO_x/SBA-17h-400	FeO_x/SBA-17h-450	FeO_x/SBA-17h-500	FeO_x/SBA-17h-550	FeO_x/SBA-17h-600
Fe^{2+}%	57.88	57.99	53.24	54.12	54.37
Fe^{3+}%	42.1	42.01	46.76	45.88	45.64

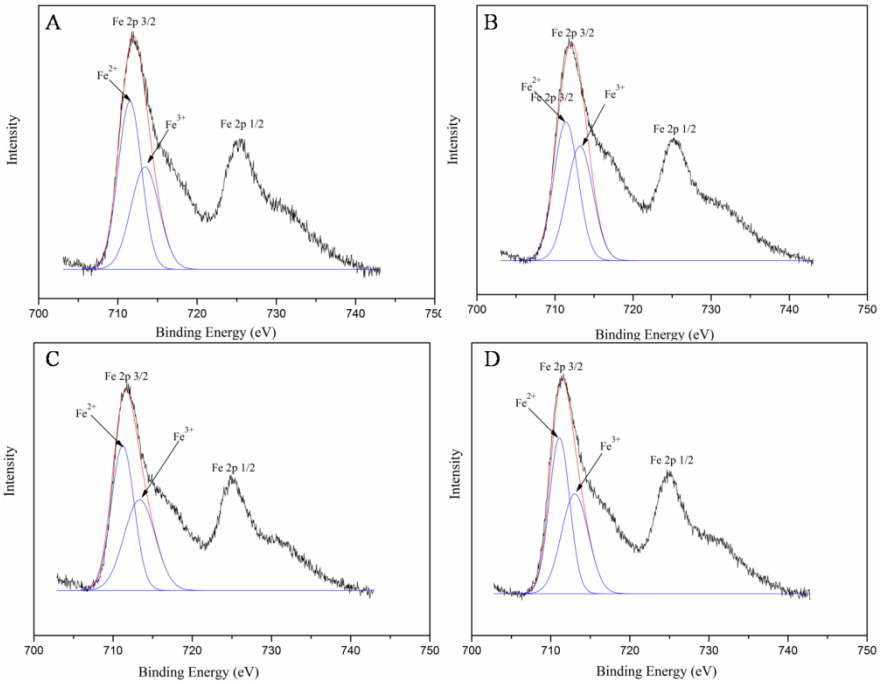

Fig. S1 XPS spectra of Fe 2p of FeO_x/SBA-17h-400 (A), FeO_x/SBA-17h-500 (B), FeO_x/SBA-17h-550 (C), FeO_x/SBA-17h-600 (D).

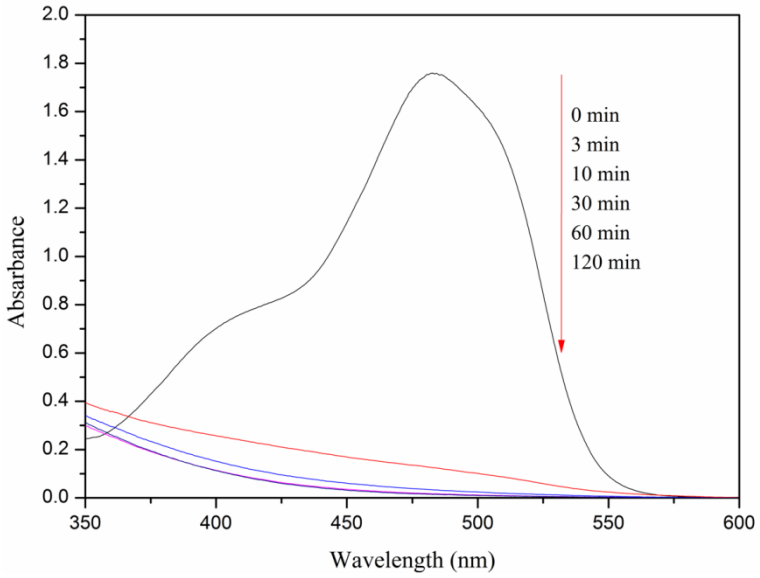

Fig. S2 UV–vis spectra changes of AO7solution with reaction time (pH_0 = 3, $[H_2O_2]$ = 15 mM, and $[FeO_x/SBA\text{-}17h\text{-}450]$ = 0.6 $g \cdot L^{-1}$, C_0 = 100 $mg \cdot L^{-1}$).

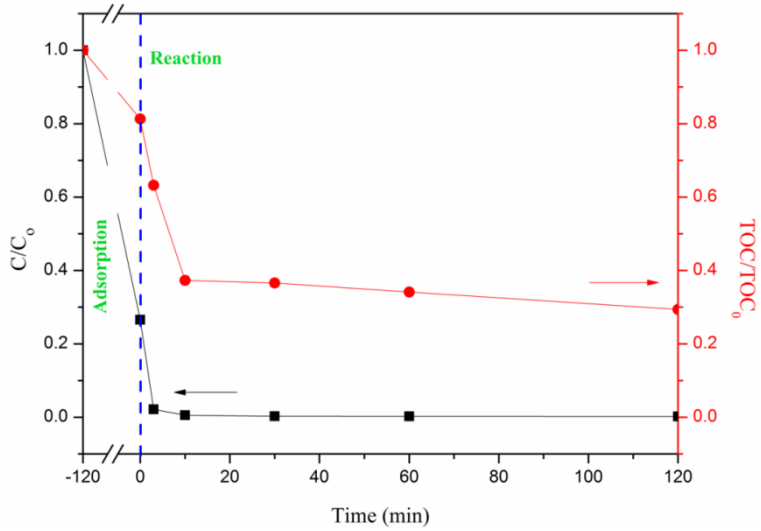

Fig. S3 Degradation efficiency and TOC removal of AO7 (pH_0 = 3, $[H_2O_2]$ = 15 mM, $[FeO_x/SBA\text{-}17h\text{-}450]$ = 0.6 g·L^{-1}, C_0 = 100 mg·L^{-1}).

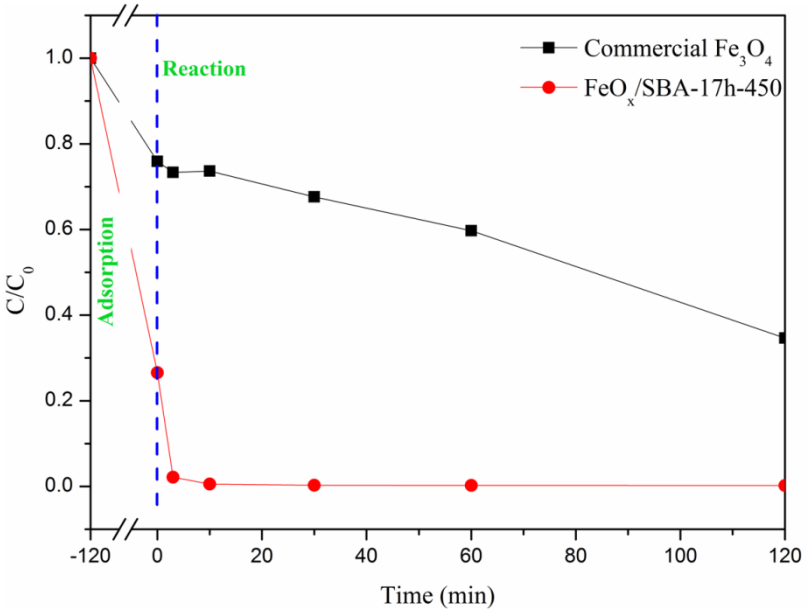

Fig. S4 Degradation efficiency of AO7 (pH_0 = 3, $[H_2O_2]$ = 15 mM, $[FeO_x$/SBA-17h-450] = 0.6 g·L^{-1}, C_0 = 100 mg·L^{-1}).

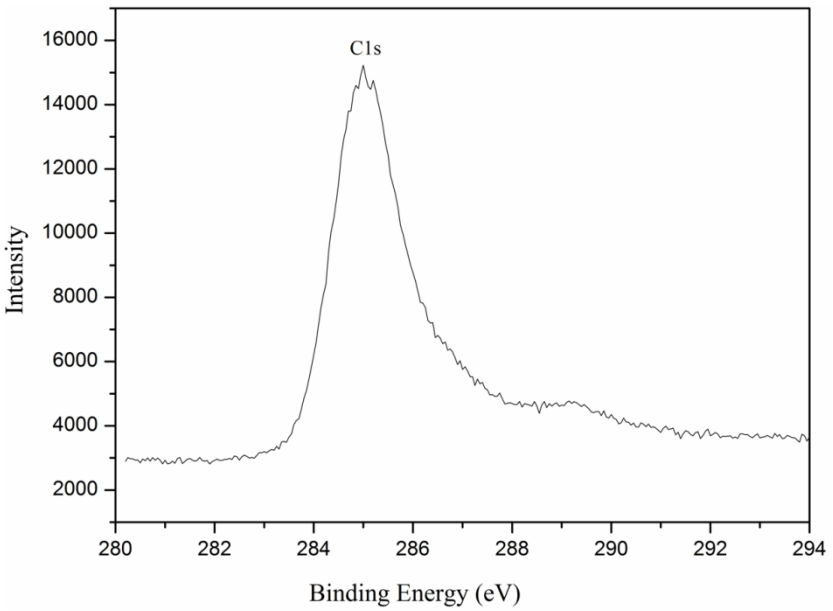

Fig. S5 XPS spectra of C1s of FeO_x/SBA-17h-450.

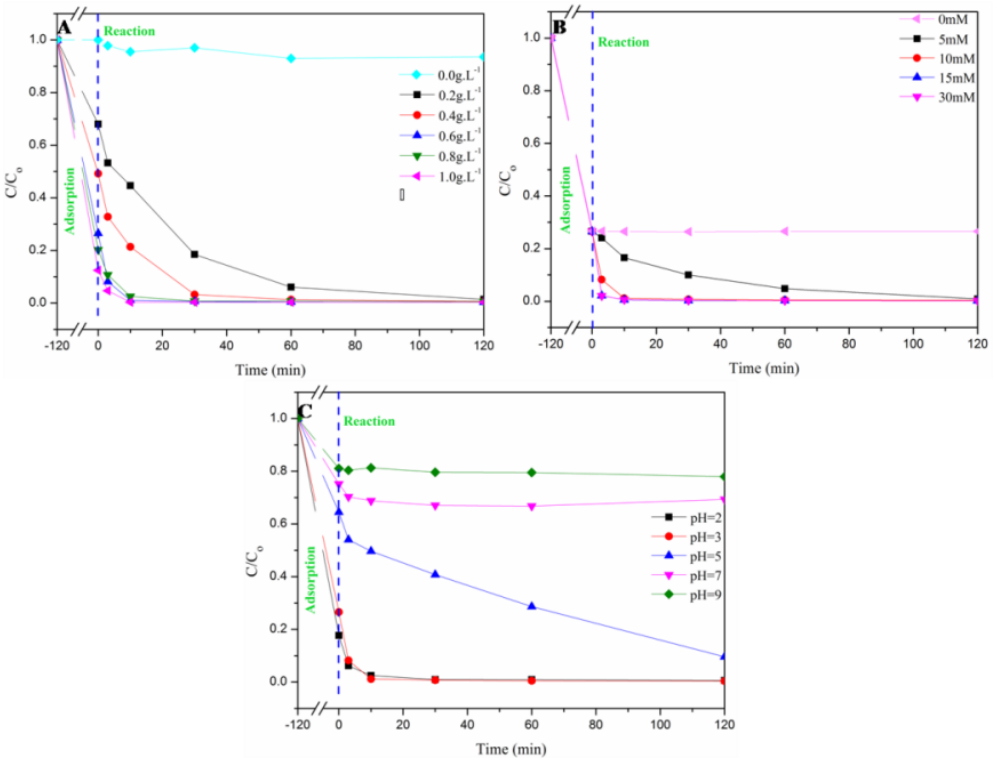

Fig. **S6** A: Influence of catalyst dosage on the catalytic activity of sample FeO_x/SBA-17h-450 ([H_2O_2] = 10 mM, pH_0 =3, C_0 = 100 mg·L-1). B: Influence of H_2O_2 dosage on the catalytic activity of FeO_x/SBA-17h-450 ([FeO_x/SBA-15] = 0.6 g·L-1, pH_0 = 3, C_0 = 100 mg·L-1). C: Influence of initial pH value on the catalytic activity of FeO_x/SBA-15 (PVI duration time = 17 h, calcination temperature = 450 ºC, [FeO_x/SBA-15] = 0.6 g·L-1, [H_2O_2] = 10 mM, C_0 = 100 mg·L-1).

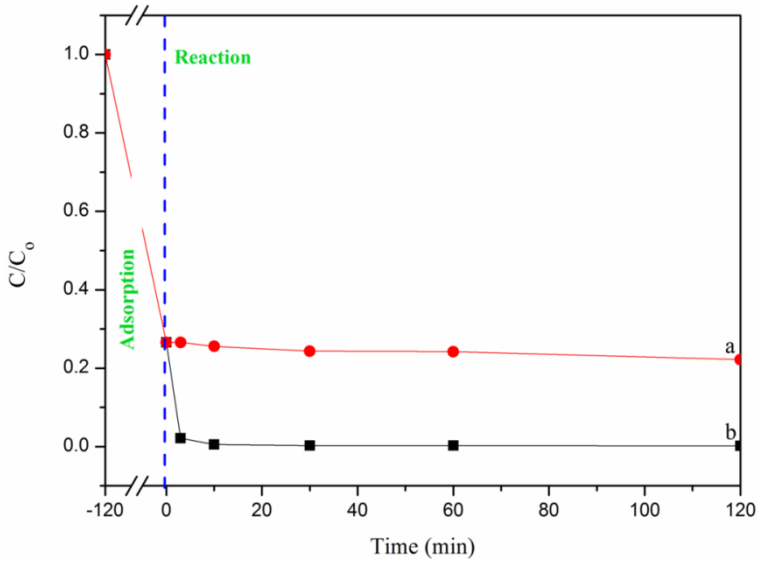

Fig. S7 Effect of HO• scavenger 2-propanol on the catalytic activity of FeOx/SBA-17h-450 ([FeO_x/SBA-17h-450] = 0.6 g·L^{-1}, [H_2O_2] = 15 mM, pH_0 = 3, C_0 = 100 mg·L^{-1}, a: $C_{2\text{-propanol}}/C_{AO7}$ molar ratio = 400:1, b: $C_{2\text{-propanol}}/C_{AO7}$ molar ratio = 0).