

Supporting Information

Single Atom Iron Catalysts With Core-Shell Structure for Peroxymonosulfate Oxidation

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Table S1. Degradation kinetic behaviour of different catalyst system

[Cat] g/L	$k_{\text{absorption}} \text{ min}^{-1}$	R^2	$k_{\text{degradation}} \text{ min}^{-1}$	R^2
0	/	/	0.006	0.9940
0.01	0.009	0.9663	0.016	0.9976
0.02	0.011	0.9665	0.025	0.9884
0.05	0.013	0.9694	0.038	0.9673
0.10	0.015	0.9973	0.138	0.9927
0.20	0.021	0.9774	0.165	0.9904

Table S2 Free radical quenching experiment's conditions

Quench item	Degrade system	Quencher	Degradation
Control group	[PMS] = 0.02 g/L, [Cat] = 0.1 g/L, [Mb]=0.05 g/L, 25°C, 60 min	/	90.74%
$\cdot\text{OH}$ and $\text{SO}_4^{\cdot-}$	[PMS] = 0.02 g/L, [Cat] = 0.1 g/L, [Mb]=0.05 g/L, 25°C, 60 min	0.1 mM MeOH	75.61%
$\cdot\text{OH}$	[PMS] = 0.02 g/L, [Cat] = 0.1 g/L, [Mb]=0.05 g/L, 25°C, 60 min	0.1 mM IPA	82.72%
$^1\text{O}_2$	[PMS] = 0.02 g/L, [Cat] = 0.1 g/L, [Mb]=0.05 g/L, 25°C, 60 min	0.01 mM BPQ	55.87%
$\text{O}_2^{\cdot-}$	[PMS] = 0.02 g/L, [Cat] = 0.1 g/L, [Mb]=0.05 g/L, 25°C, 60 min	0.01 mM His	76.59%

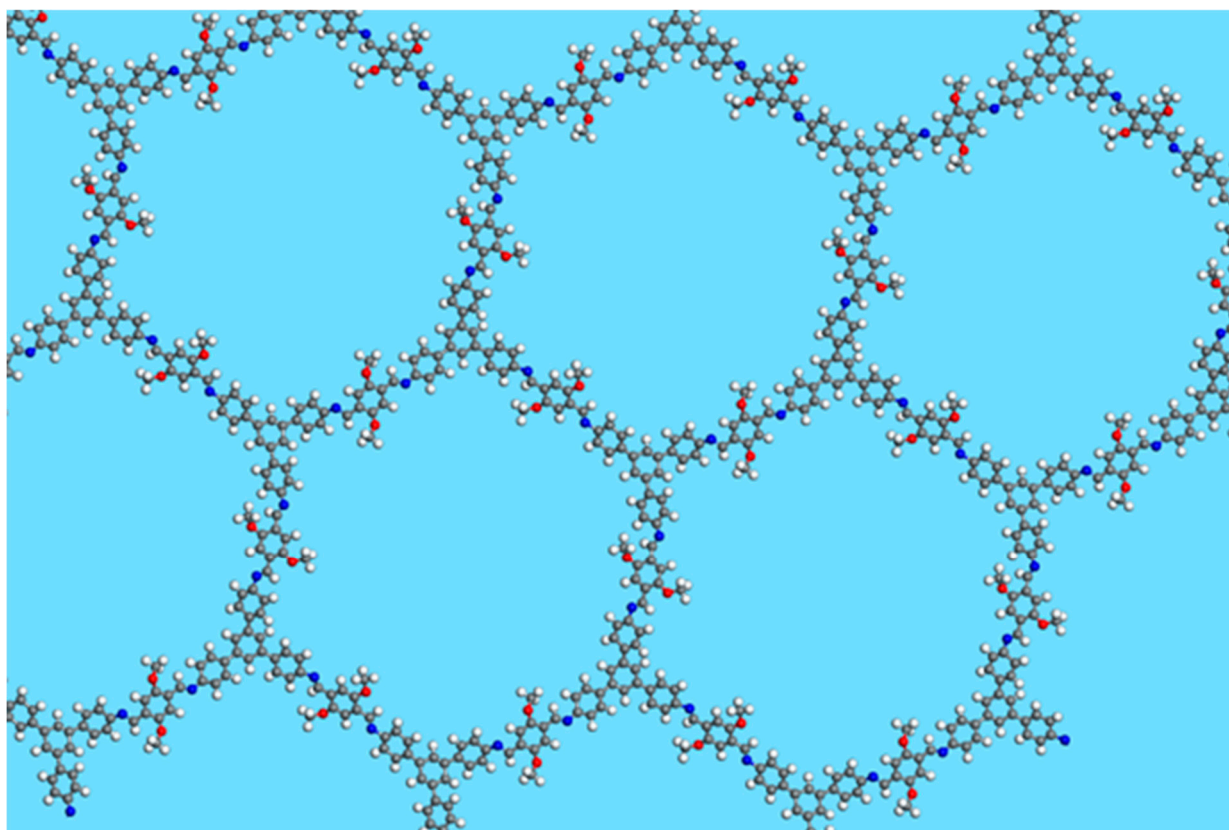


Figure S1. Crystal model of DMTPCOF

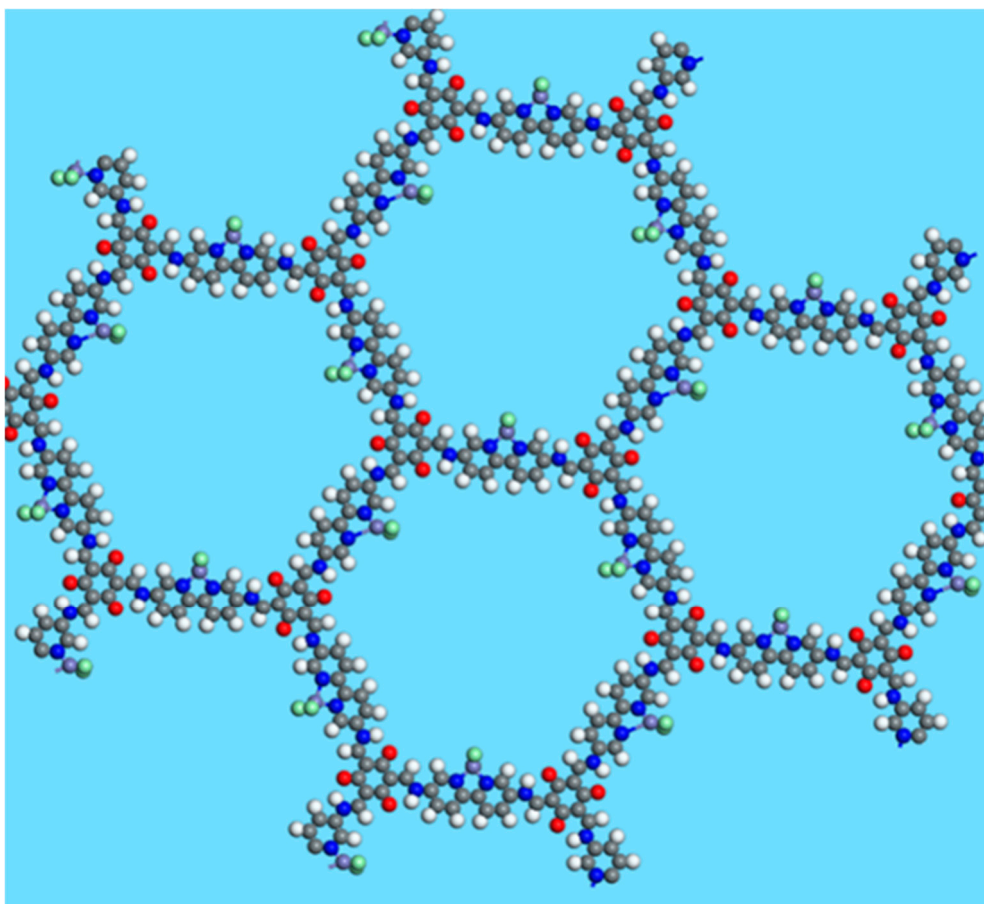


Figure S2. Crystal model of BpyCOF

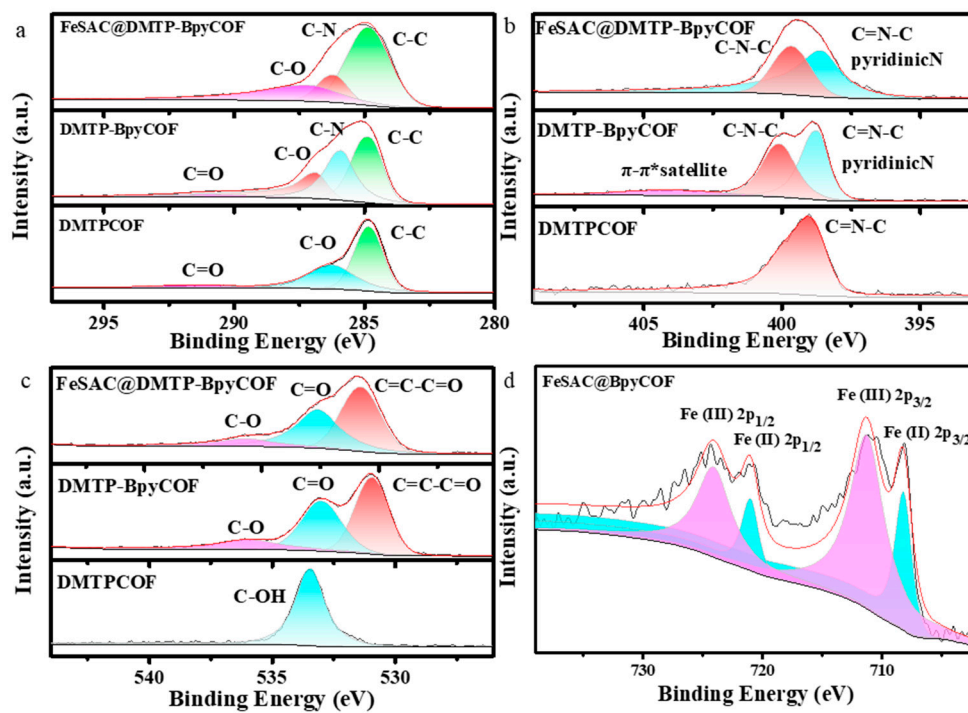


Figure S3. XPS profiles of FeSAC@DMTP-BpyCOF and its precursors (a) C1s (b) N1s (c) O1s (d) Fe2p

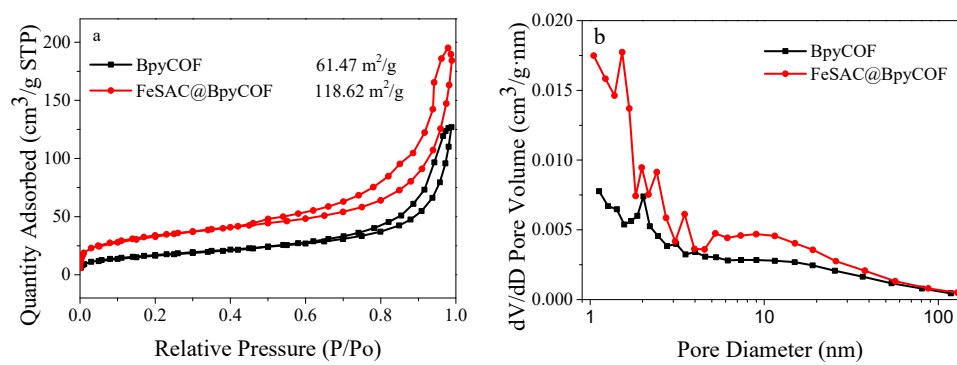


Figure S4 BET of FeSAC@BpyCOF and its precursors

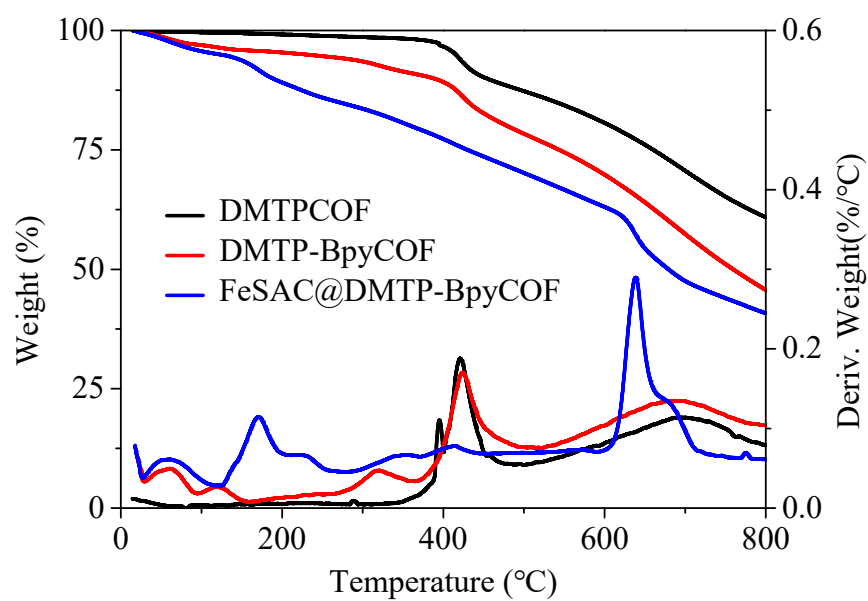


Figure S5. TG (left,up) and DTG (right,down) curves of FeSAC@DMTP-BpyCOF and its precursors

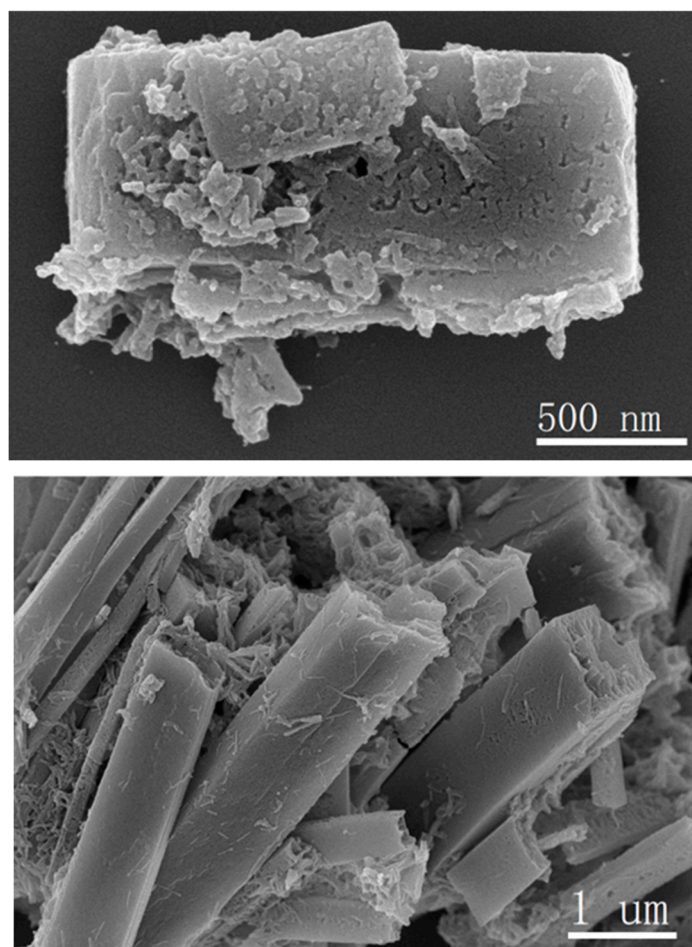


Figure S6. SEM images of BpyCOF

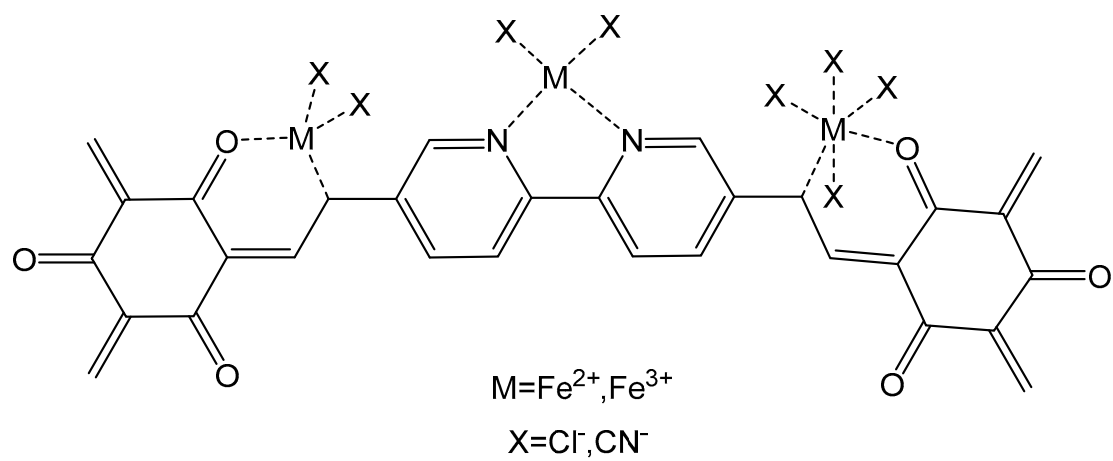


Figure S7. The existence form and chemical environment of iron element

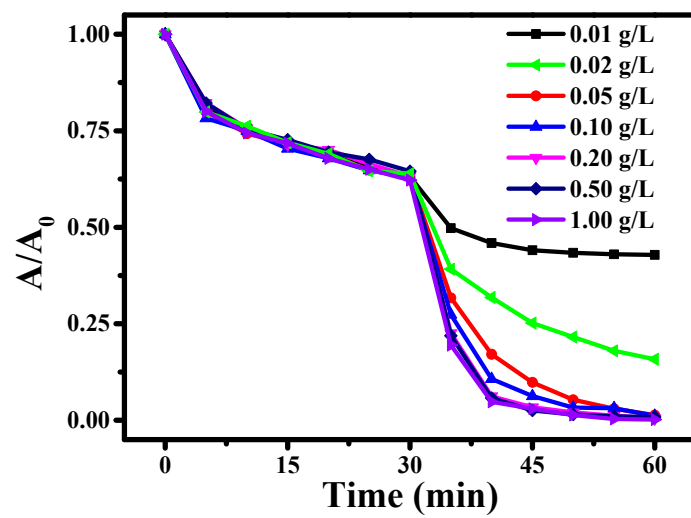


Figure S8. Effect of PMS concentration on the degradation of MB ([Cat] = 0.1 g/L, [MB] = 0.05 g/L)

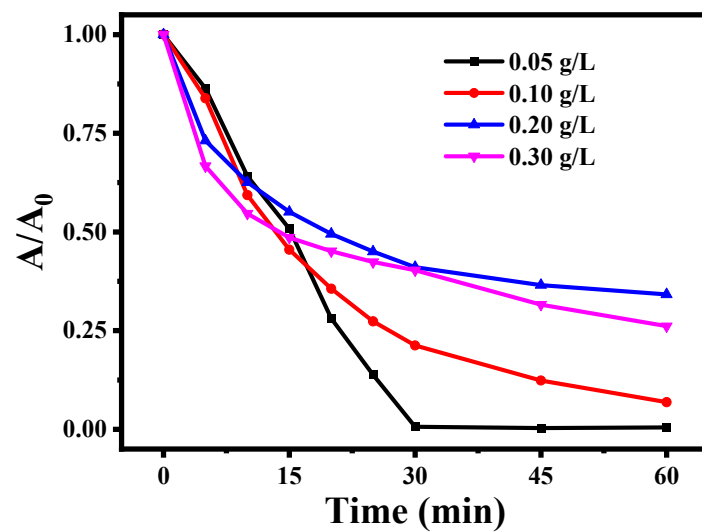


Figure S9. Effect of MB concentration on catalytic efficiency ($[PMS] = 0.1 \text{ g/L}$, $[Cat] = 0.1 \text{ g/L}$)

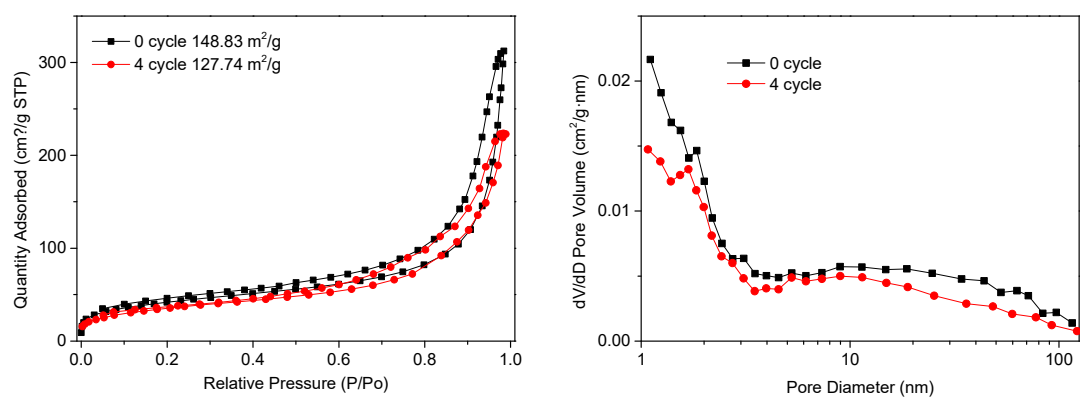


Figure S10. BET of FeSAC@DMTP-BpyCOF in cycle

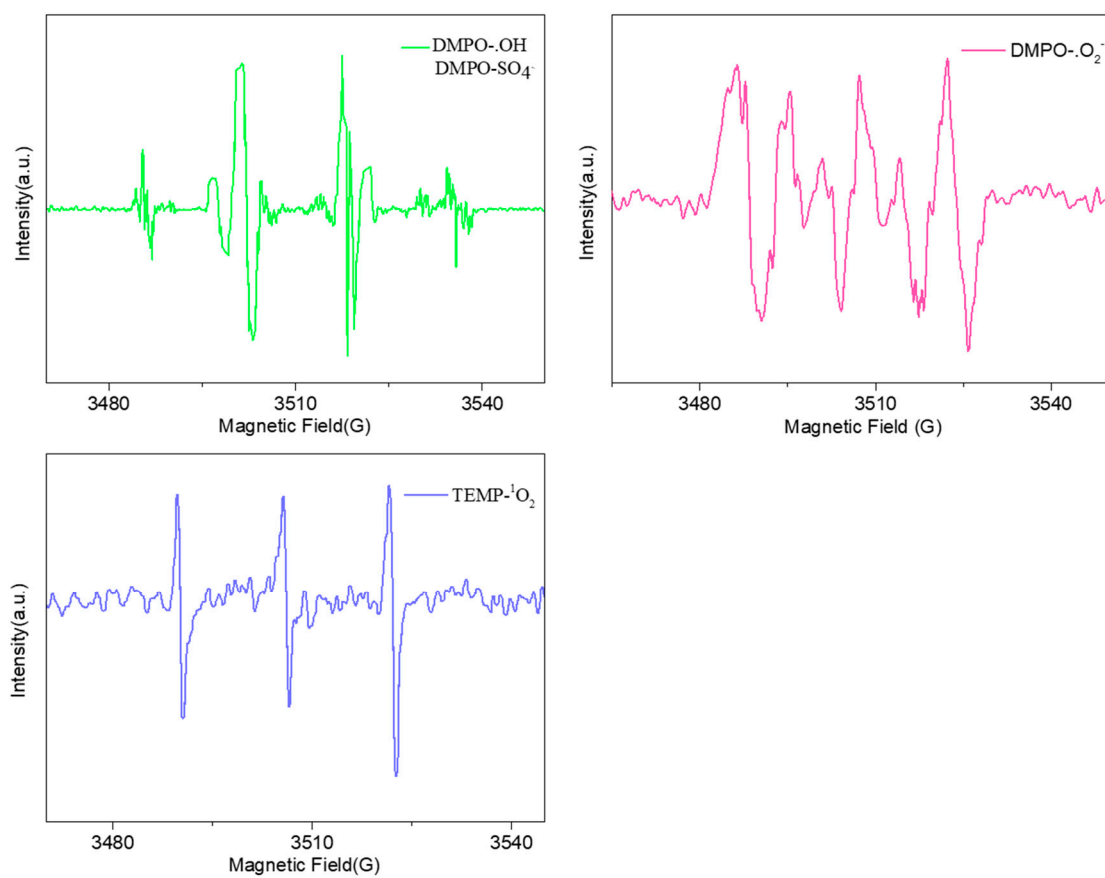


Figure S11. EPR spectra of the FeSAC@DMTP-BpyCOF/PMS system

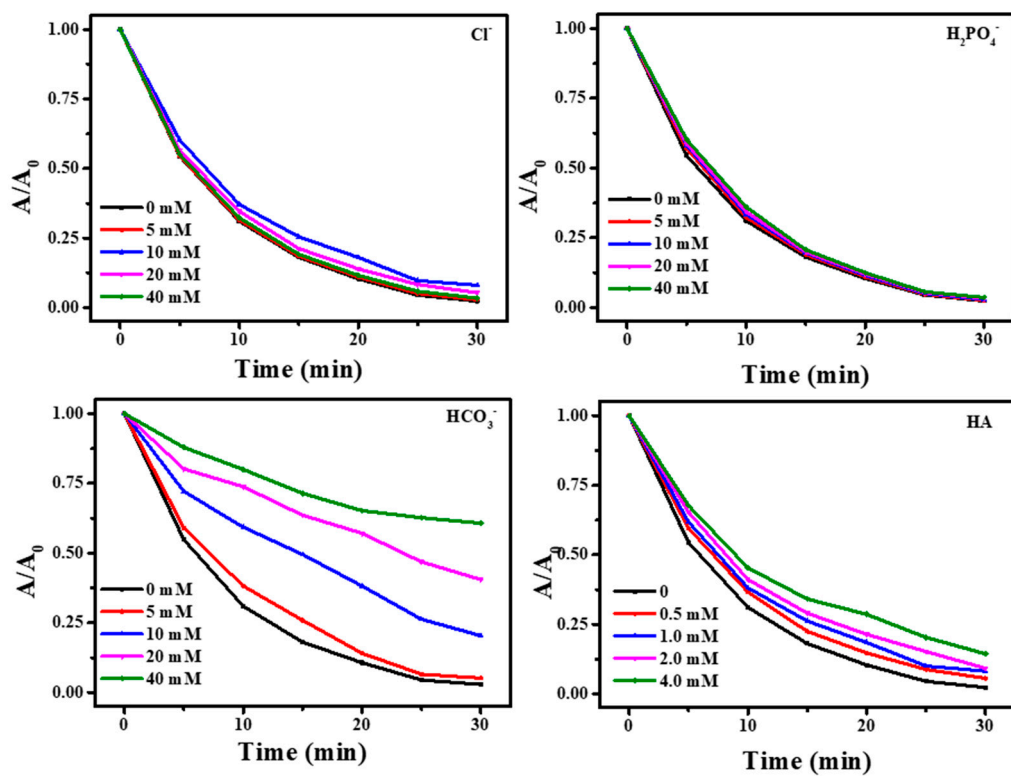


Figure S12. Influence of common ions and organics in water on degradation rates of MB([PMS] = 0.05 g/L, [Cat] = 0.1 g/L, [Mb] = 0.05 g/L)