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Supporting Information

Cocatalyst or substrate? Competitive Fenton transformation of Cysteine and Salicylic acid

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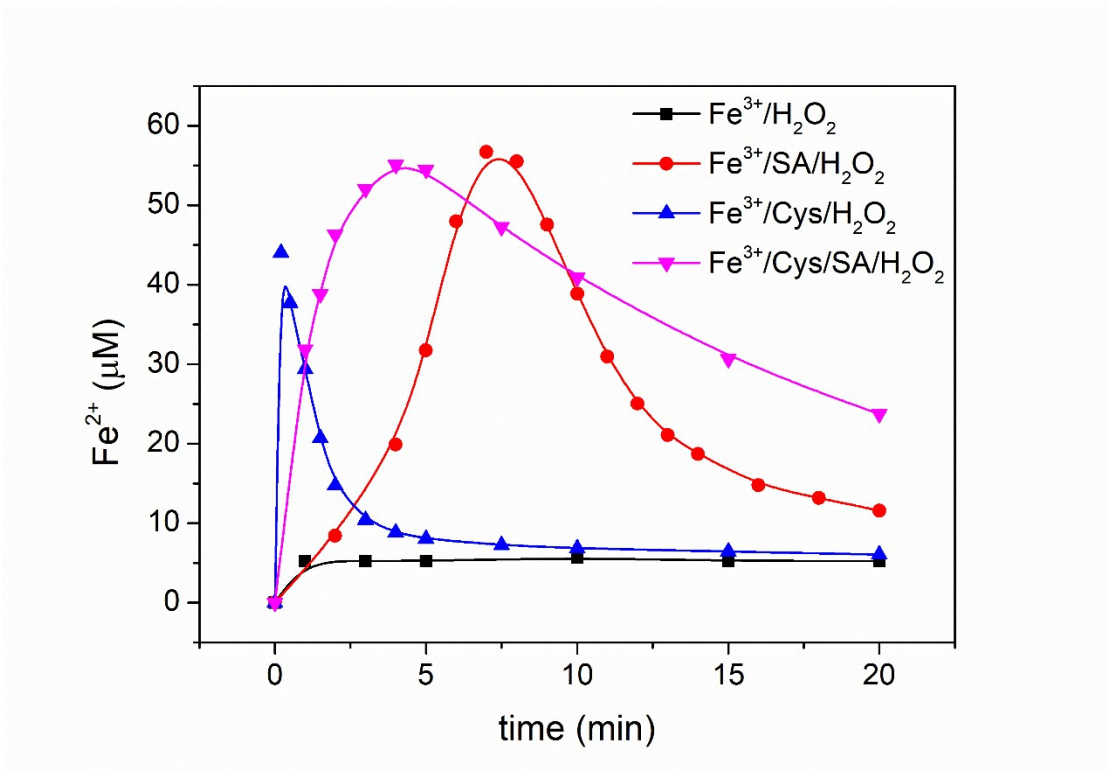


Fig. S1. The concentration of Fe^{2+} versus time in different systems. Initial concentrations: 1mM H_2O_2, 0.1mM Fe^{3+}, 0.1mM SA, 0.1mM Cys, pH=3.5

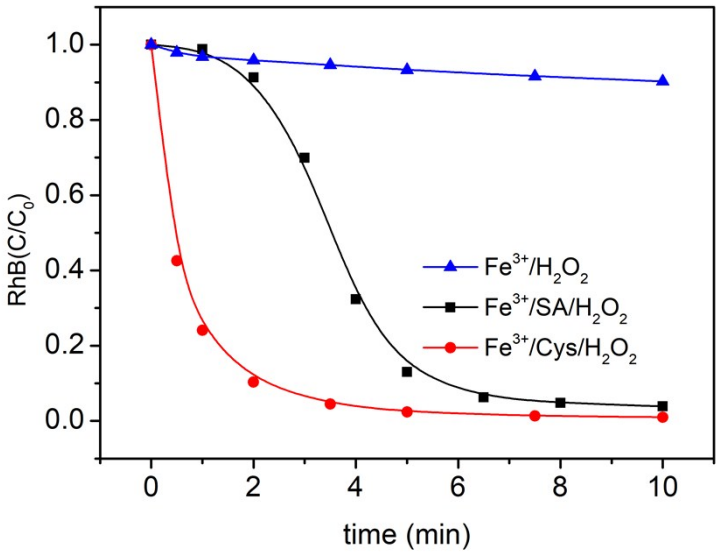


Fig. S2. Time profiles of the RhB degradation in various systems. Initial concentrations: 20μM RhB, 1mM H_2O_2, 0.1mM Fe^{3+}, 0.1mM Cys, 0.1mM SA, pH=3.5

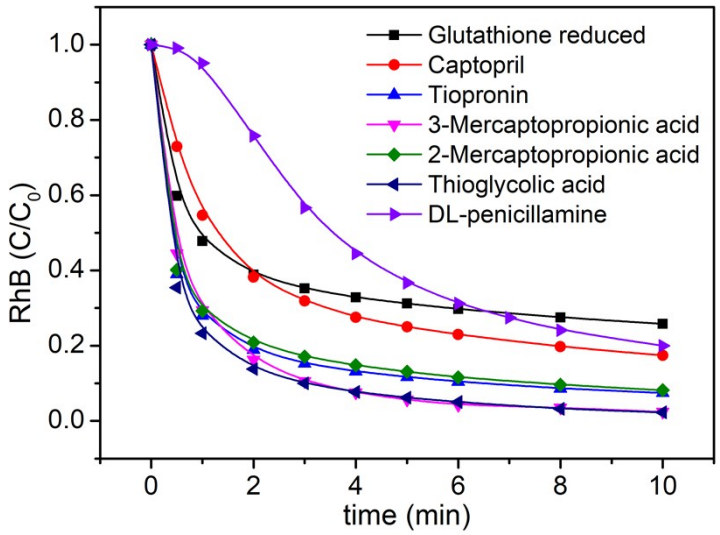


Fig. S3. Time profiles of the RhB degradation in presence of sulfhydryl compound. Initial concentrations: 20μM RhB, 1mM H_2O_2, 0.1mM Fe^{3+}, 0.1mM Cys, 0.1mM sulfhydryl compound, pH=3.5

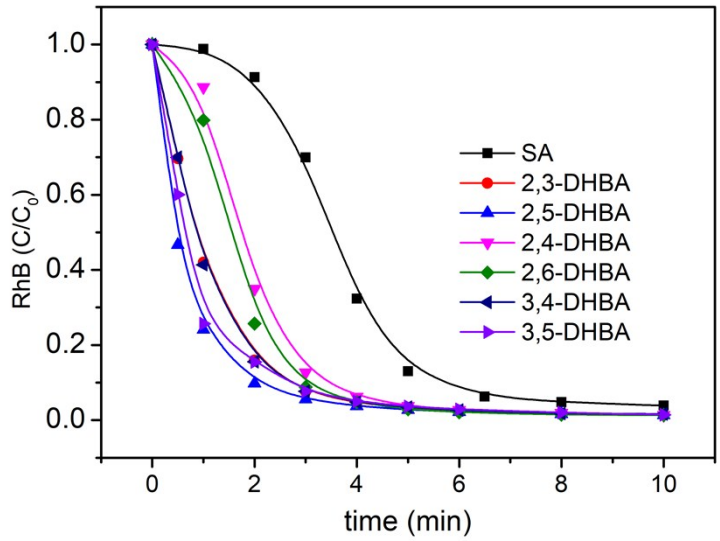


Fig. S4. Time profiles of the RhB degradation in presence of DHBAs. Initial concentrations: 20μM RhB, 1mM H_2O_2, 0.1mM Fe^{3+}, 0.1mM Cys, 0.1mM DHBAs, pH=3.5

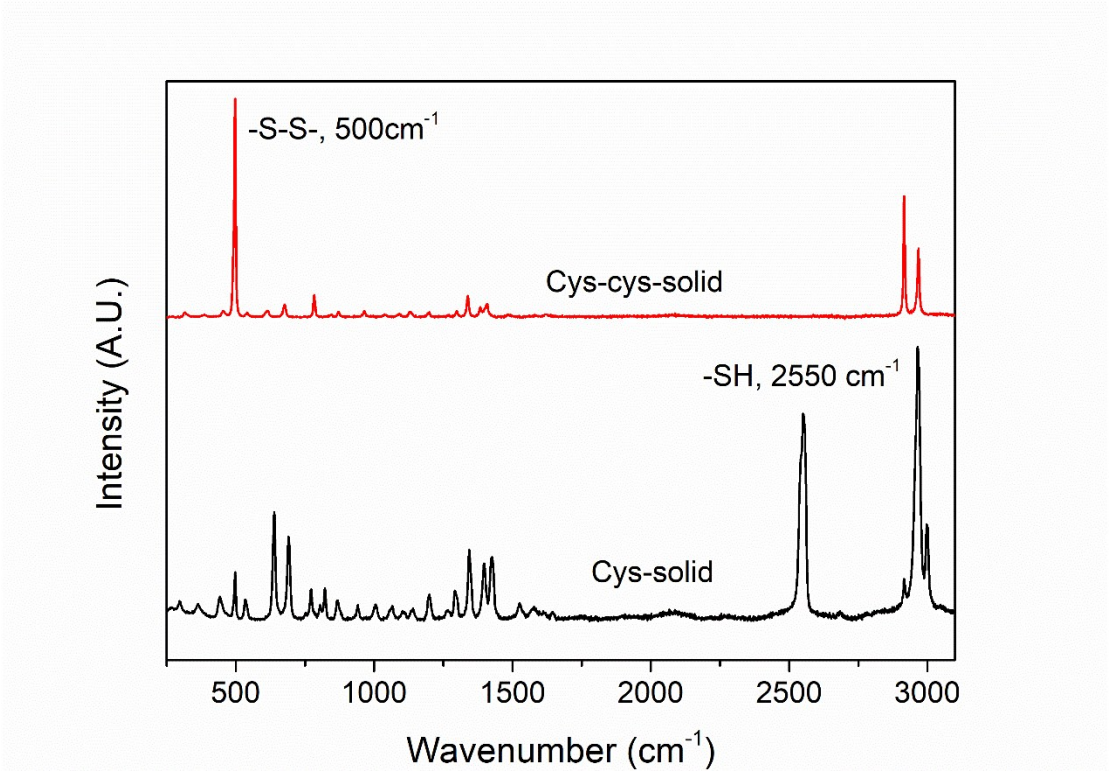


Fig. S5. Raman spectra of Cys solid and Cys-cys solid.

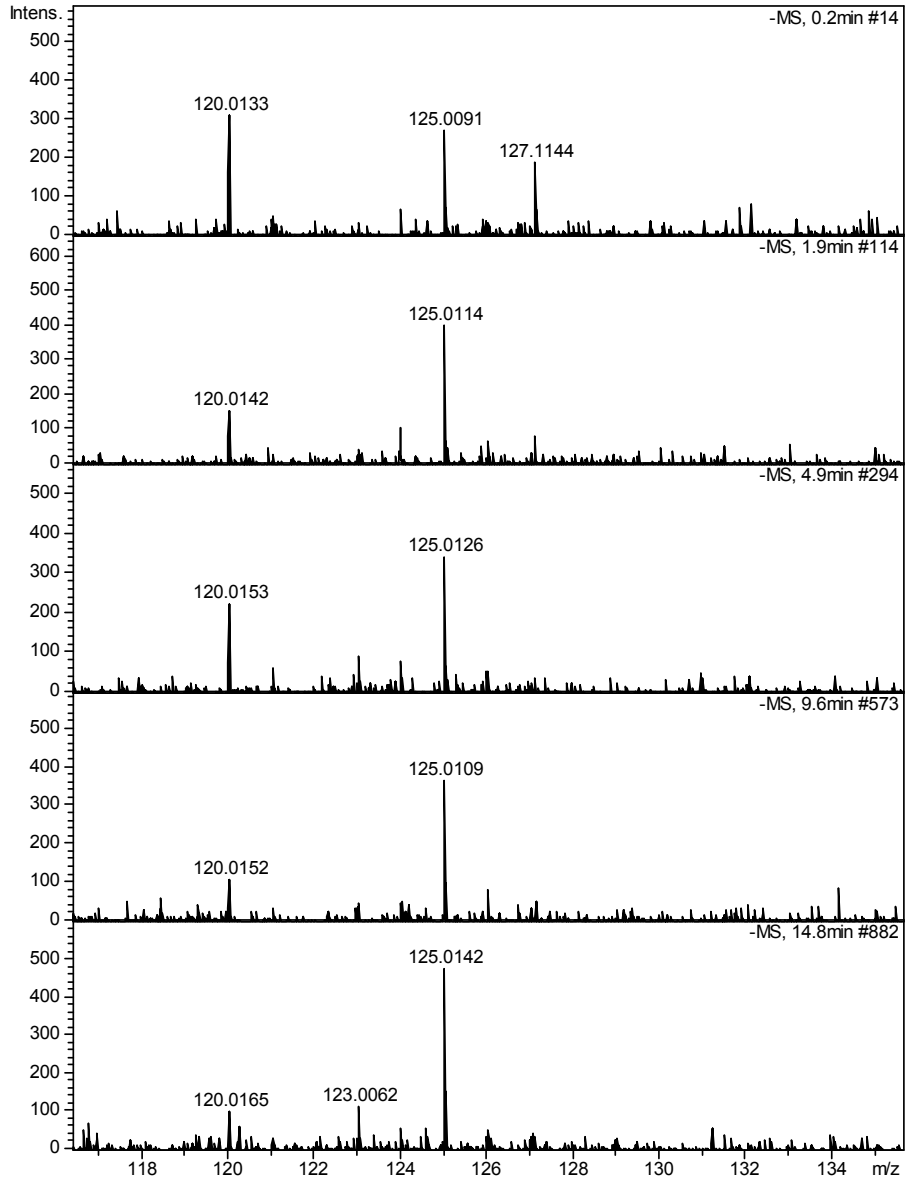


Fig. S6. The ESI-MS spectrometry of taurine in H_2O_2-Fe^{3+}-Cys-SA system at different reaction times. Initial concentration: 10mM H_2O_2, 1mM $FeCl_3$, 4mM SA, 4mM Cys. Reaction time 15minutes.

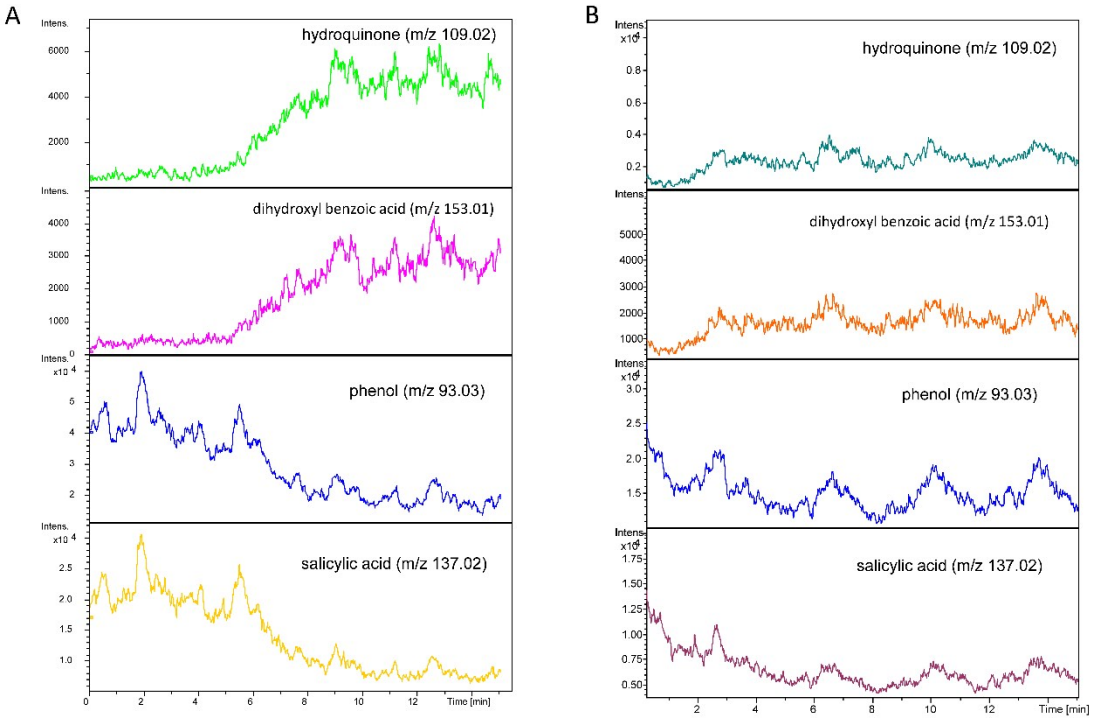


Fig. S7. The total irons chromatograph (TIC) of intermediate products change of SA in different systems. (A) H_2O_2-Fe^{3+}-SA system (B) H_2O_2-Fe^{3+}-Cys-SA system. Initial concentration: 10mM H_2O_2, 1mM $FeCl_3$, 4mM SA, 4mM Cys. Reaction time 15minutes.

Table S1

Small molecule organic cocatalyst	reference
Quinone-hydroquinone analogues	
Salicylic acid	[1]
Alizarin Violet3B(AV)	[2]
Alizarin Red	[2]
1,2-Dihydroxybenzenes(1,2-DHBs)	[3]
Protoctechuic acid	[4]
Dopamine	[5]
2,5-dihydroxy-1,4-benzoquinone	[6]
sulfhydryl compounds	
Cysteine	[7]
3-mercaptopropionic acid	[7]
Thioglycolic acid	[8]
Glutathione Reduced	[7]
2- mercaptopropionic acid	See Fig. S3
Thiopronin	See Fig. S3
Captopril	See Fig. S3
DL-penicillamine	See Fig. S3
Reducing compounds	
Hydroxylamine	[9]

Table S2. The chemical character of quinone-hydroquinone analogues.

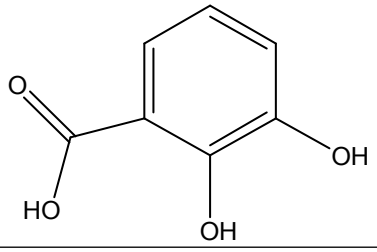
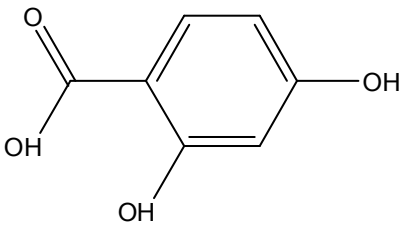
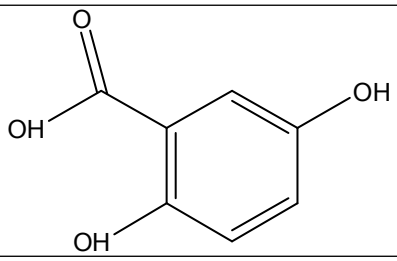
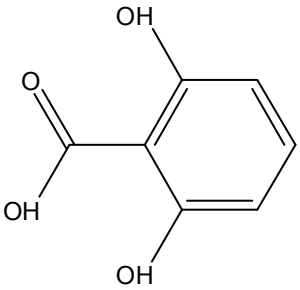
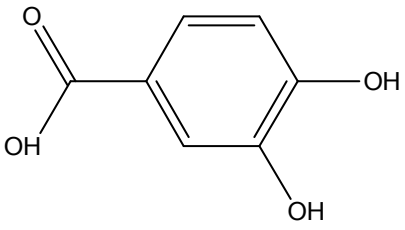
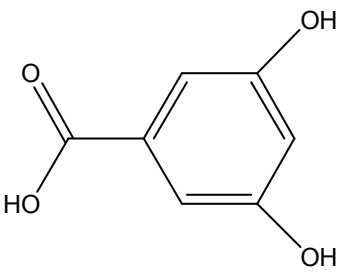
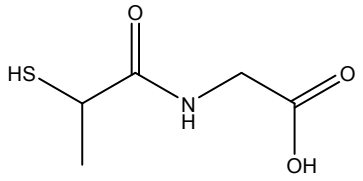
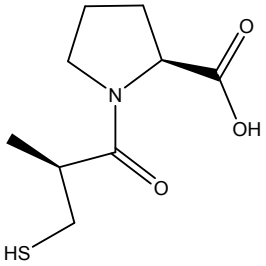
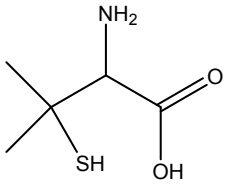
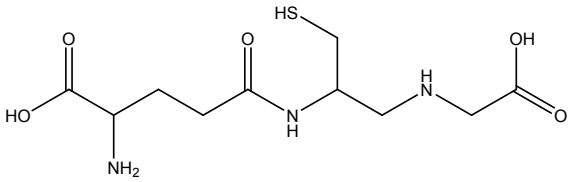
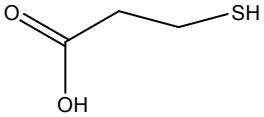
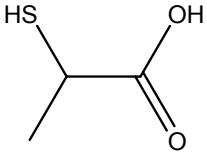
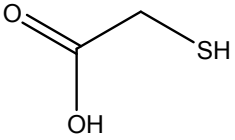
quinone-hydroquinone analogues	molecular weight	Chemcial structure
2,3-Dihydroxybenzoic acid	154.12	
2,4-Dihydroxybenzoic acid	154.12	
2,5-Dihydroxybenzoic acid	154.12	
2,6-Dihydroxybenzoic acid	154.12	
3,4-Dihydroxybenzoic acid	154.12	
3,5-Dihydroxybenzoic acid	154.12	

Table S3. The chemical character of sulfhydryl organic compounds.

sulfhydryl organic compounds	molecular weight	Chemcial structure
Thiopronin	163.19	
Captopril	217.29	
DL-penicillamine	149.21	
Glutathione Reduced	307.32	
3-mercaptopropionic acid	106.14	
2-mercaptopropionic acid	106.14	
Thioglycolic acid	92.12	

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