

Supplementary Materials

Ascorbic acid enhanced ferrous/persulfate system for degradation of tetracycline contaminated groundwater

Hengyi Wang^{a,b}, Liyang Zhao^{a,b}, Qian Li^{a,b}, Xixiang Liu^{a,b,c}, Liying Liang^{a,b}, Jianmei Cen^{a,b}, Yan Liu^{a,b}*

^aSchool of Materials and Environment, Guangxi Minzu University, Nanning 530006, China.

^bResearch Center for Soil and Groundwater Environment, Guangxi Minzu University, Nanning 530006, China.

^cGuangxi Research Institute of Chemical Industry Co., Ltd., Nanning 530001, China.

**Corresponding Author. Email: liuwx200208@163.com (X.X. Liu)*

Supplementary materials includes a total of 4 figures and 2 tables.

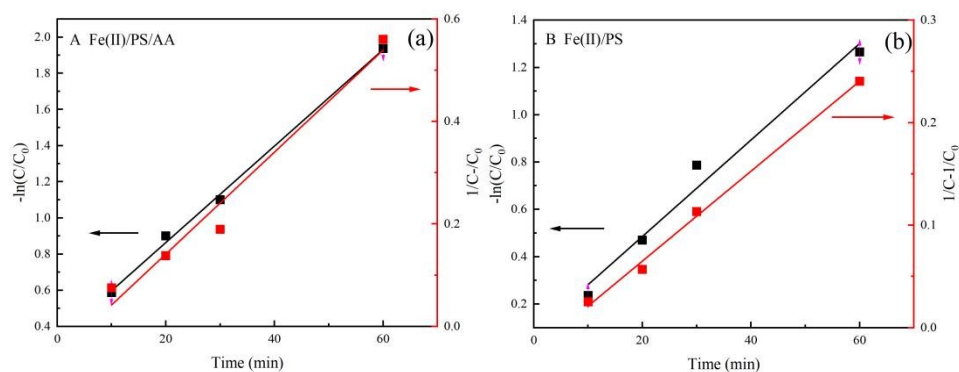


Fig. S1 Comparison of system dynamics between Fe(II)/PS/AA and Fe(II)/PS. Experimental conditions: TC dosage=10 mg L⁻¹, Fe(II) dosage=0.01 mM, PS dosage=0.8 mM, AA dosage=0.05mM, initial pH was not adjusted.

Table S1 Kinetics constants of TC degradation by Fe(II)/PS/AA and Fe(II)/PS system.

Reaction system	Kinetic series	The fitted reaction rate equation	$K_{app1}(\text{min}^{-1})$ $K_{app2}(\text{L mg}^{-1} \text{min}^{-1})$	R^2
Fe(II)/PS/AA	Pseudo-first order	$-\ln(C/C_0)=0.3306+0.0266t$	0.0266	0.996
	Pseudo-second order	$1/C-1/C_0=-0.0576+0.0099t$	0.0099	0.955
Fe(II)/PS	Pseudo-first order	$-\ln(C/C_0)=-0.0228+0.0043t$	0.0043	0.994
	Pseudo-second order	$1/C-1/C_0=0.0778+0.0203t$	0.0203	0.966

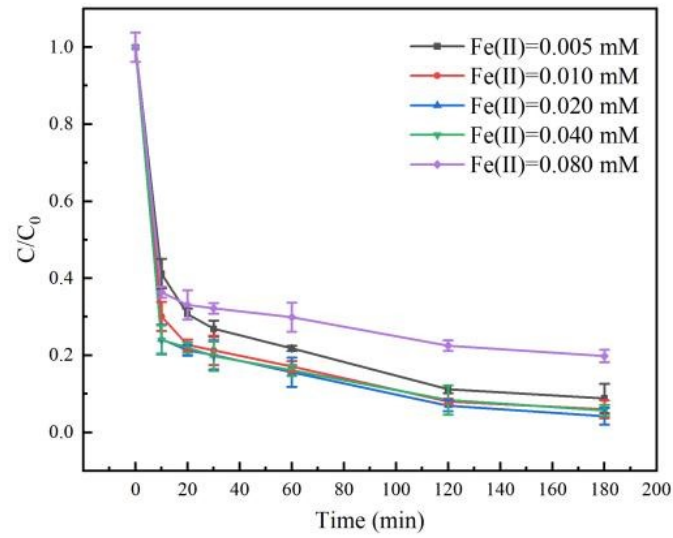


Fig. S2 Effect of Fe(II) dosage of the Fe(II)/PS/AA system for the removal of TC. Experimental conditions: TC dosage=10 mg L⁻¹, Fe(II) dosage=0.01 mM, PS dosage=0.8 mM, AA dosage=0.05 mM, initial pH was not adjusted.

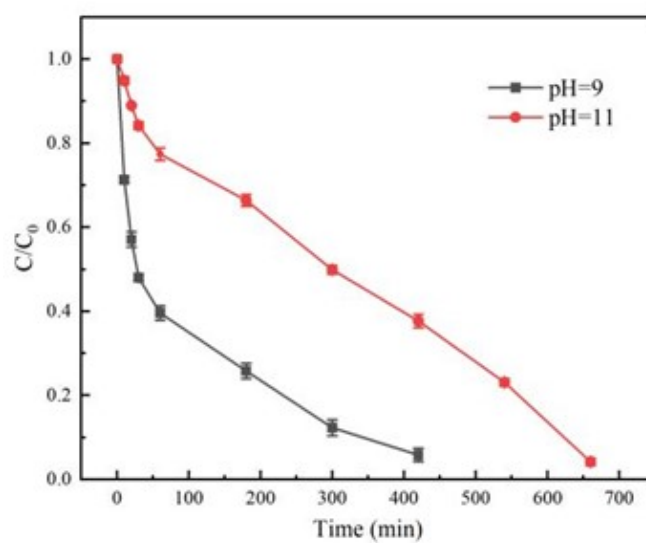


Fig. S3 Effect of pH on degradation of TC in Fe(II)/PS/AA system. Experimental conditions: TC dosage=10 mg L⁻¹, Fe(II) dosage=0.01 mM, PS dosage=0.8 mM, AA dosage=0.05 mM.

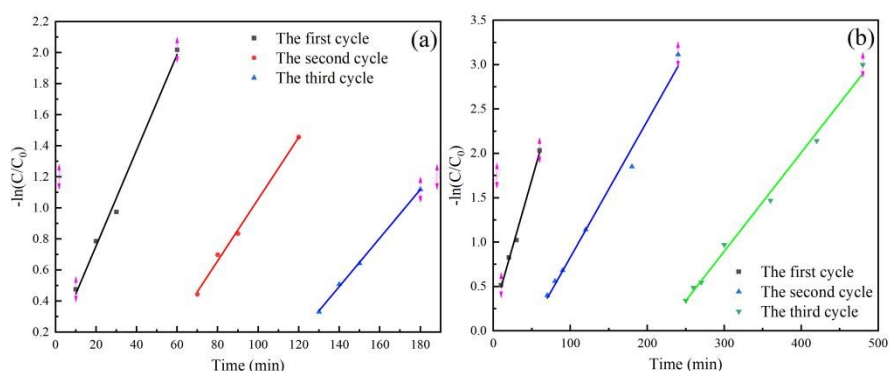


Fig. S4 Reusability evaluation of Fe(II). Experimental conditions: TC dosage=10 mg L⁻¹, Fe(II) dosage=0.01 mM, PS dosage=0.8 mM, AA dosage=0.05mM, initial pH was not adjusted.

Table S2 Kinetics constants of TC degradation by Fe(II)/PS/AA system in the experiment of Fe(II) Reusability evaluation.

	Cycle period	Pseudo-first-order kinetics fitting reaction rate equation	$K_{app}(\text{min}^{-1})$	R^2
(a)	First	$-\ln(C/C_0)=0.1386+0.0308t$	0.0308	0.995
	Second	$-\ln(C/C_0)=-0.9304+0.0198t$	0.0198	0.997
	Third	$-\ln(C/C_0)=-1.6931+0.0156t$	0.0156	0.999
(b)	First	$-\ln(C/C_0)=0.1901+0.0303t$	0.0303	0.996
	Second	$-\ln(C/C_0)=-0.7075+0.0153t$	0.0153	0.994
	Third	$-\ln(C/C_0)=-2.4410+0.0111t$	0.0111	0.997