Supplementary material

Table S1 Characteristics of groundwater used in this research

parameter	value
pH	7.5
total organic carbon/(TOC, $mg \cdot L^{-1}$)	12.5
Cl^- concentration/($mg \cdot L^{-1}$)	88.6
HCO_3^- concentration/($mg \cdot L^{-1}$)	133.3
NO_3^- concentration/($mg \cdot L^{-1}$)	5.1
SO_4^{2-} concentration/($mg \cdot L^{-1}$)	73.8
Fe(II) concentration/($mg \cdot L^{-1}$)	1.4
total Fe concentration/($mg \cdot L^{-1}$)	2.1

Table S2 k_{obs} of TCE degradation under different conditions

No.	operational conditions	k_{obs}/min^{-1}	R^2
1	CP/Fe(III)/TCE = 4/8/1	0.0012±0.0001	0.94
2	CP/Fe(III)/TCE = 10/20/1	0.0033±0.0003	0.97
3	CP/Fe(III)/TCE = 20/40/1	0.0170±0.0014	0.96
4	CP/Fe(III)/CA/TCE = 4/8/1/1	0.0057±0.0002	0.99
5	CP/Fe(III)/CA/TCE = 4/8/2/1	0.0534±0.0032	0.97
6	CP/Fe(III)/CA/TCE = 4/8/4/1	0.0454±0.0033	0.95
7	CP/Fe(III)/CA/TCE = 4/8/8/1	0.0089±0.0005	0.97

Table S3. Percentage distribution of Fe(III) species under different conditions

CA /(mmol·L^{-1})	pH	Fe^{3+}	$Fe(III)L^{-}$	Fe(III)HL	$Fe(III)H_2L^{+}$	$Fe(III)(OH)^{2+}$	$Fe(III)(OH)_2^{+}$	$Fe(III)(OH)_{3(aq)}$
0	3.15	30.9%	0	0	0	38.9%	30.2%	0
0.15	3.02	35.4%	7.8%	4.7%	0	33.1%	19.0%	0
0.30	2.86	39.4%	13.3%	11.6%	0.1%	25.5%	10.1%	0
0.60	2.54	36.5%	17.8%	32.0%	0.4%	11.2%	2.1%	0
1.20	2.35	5.0%	24.3%	68.4%	1.3%	0.9%	0.1%	0

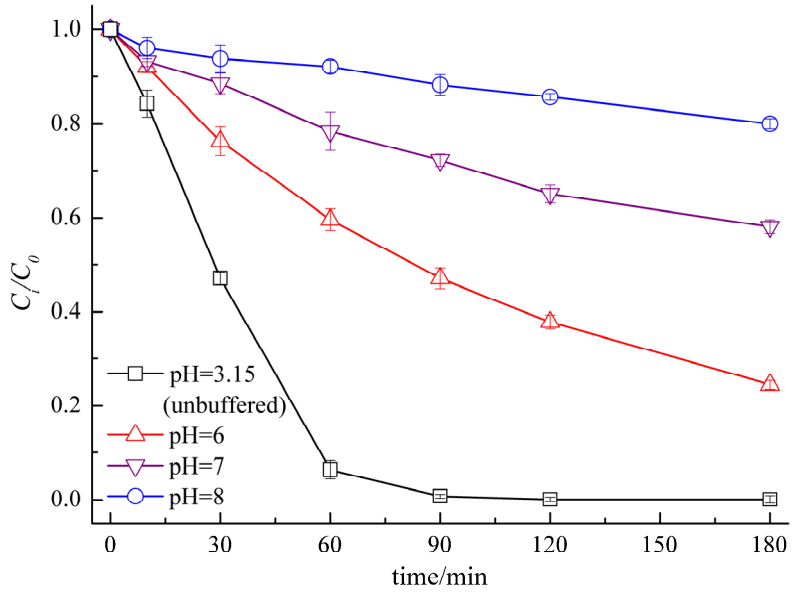

Fig. S1 Effect of solution pH on TCE degradation ($[TCE]_0$ = 0.15 mmol·L^{-1}, $[CP]_0$ = 0.60 mmol·L^{-1}, $[Fe(III)]_0$ = 1.20 mmol·L^{-1}, $[CA]_0$= 0.30 mmol·L^{-1})