Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary data

for

Determination of phenol degradation in chloride ion rich water by ferrate using chromatographic method in combination with on-line mass spectrometry analysis

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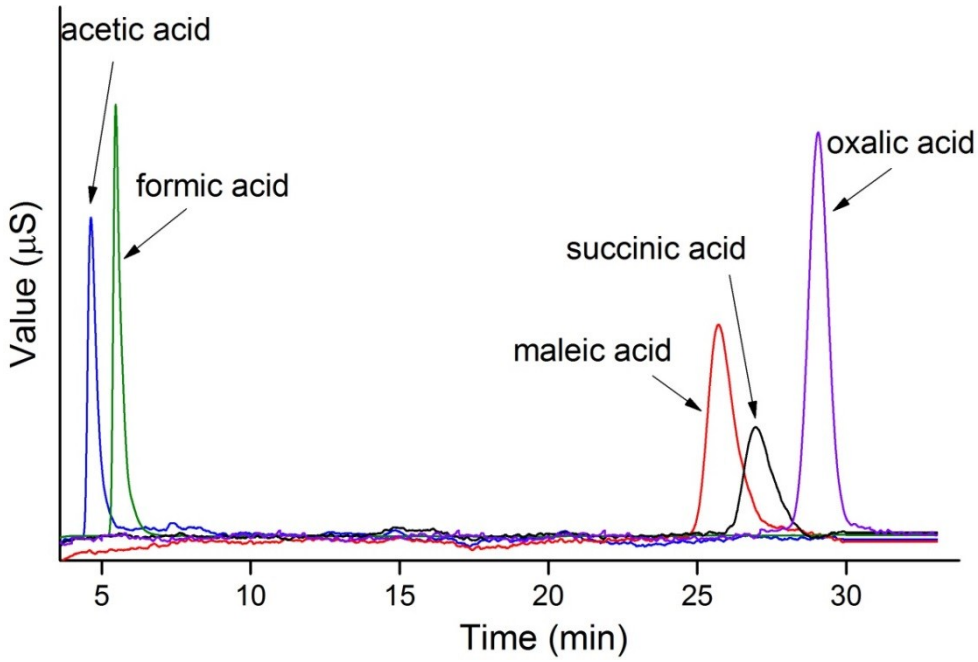

Fig. S1 Integrated IC chromatograms of standards of possible organic byproducts formed during phenol degradation by Fe(VI). Standard concentration: 1ppm of formic acid and oxalic acid, and 10 ppm of acetic acid, maleic acid and succinic acid.

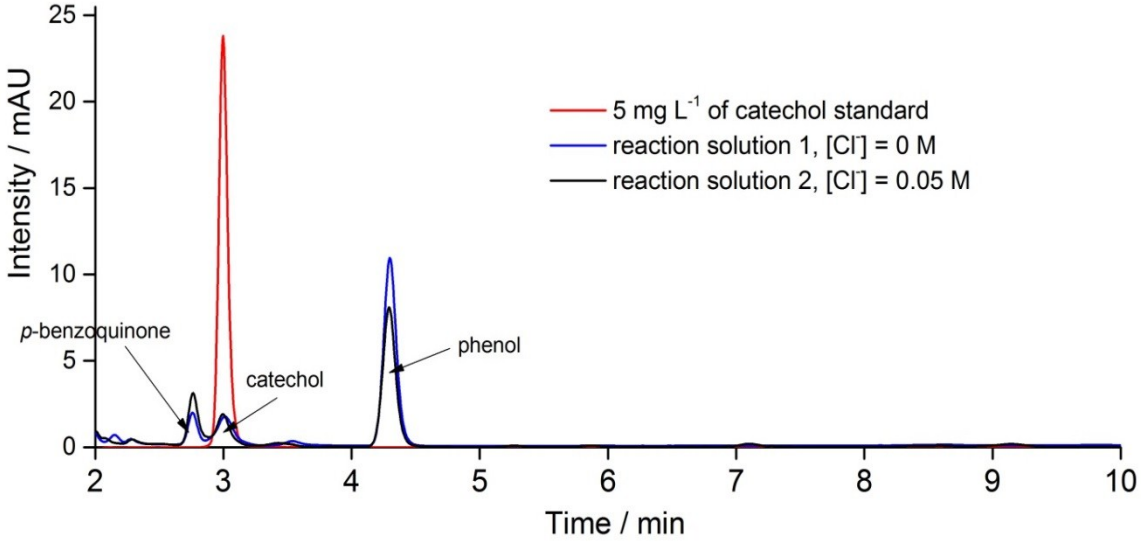

Fig. S2 HPLC chromatograms of catechol with comparison to 5 mg L^{-1} standard during phenol degradation by Fe(VI). Experimental conditions: [phenol] = 0.1 mM, [Fe(VI)] = 0.5 mM, pH = 6.5.

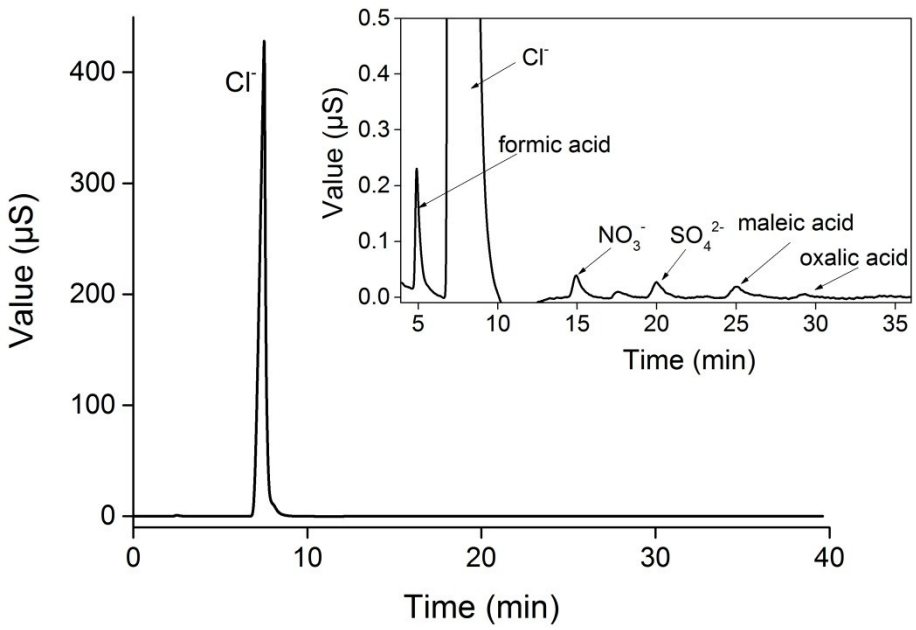

Fig. S3 IC chromatograms of various intermediates after phenol degradation by Fe(VI). Experimental conditions: [phenol] = 0.1 mM, $[Cl^-]_0$ = 0.05 M, [Fe(VI)] = 0.5 mM, reaction time = 45 min, pH = 9.

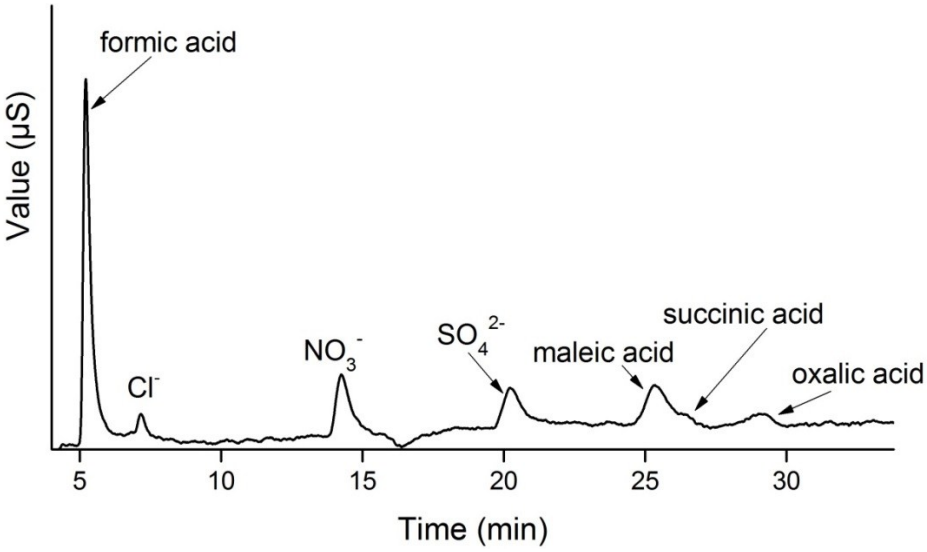

Fig. S4 IC chromatograms of various intermediates after phenol degradation by Fe(VI). Experimental conditions: [phenol] = 0.1 mM, $[Cl^-]$ = 0 M, [Fe(VI)] = 0.5 mM, reaction time = 45 min, pH = 9.

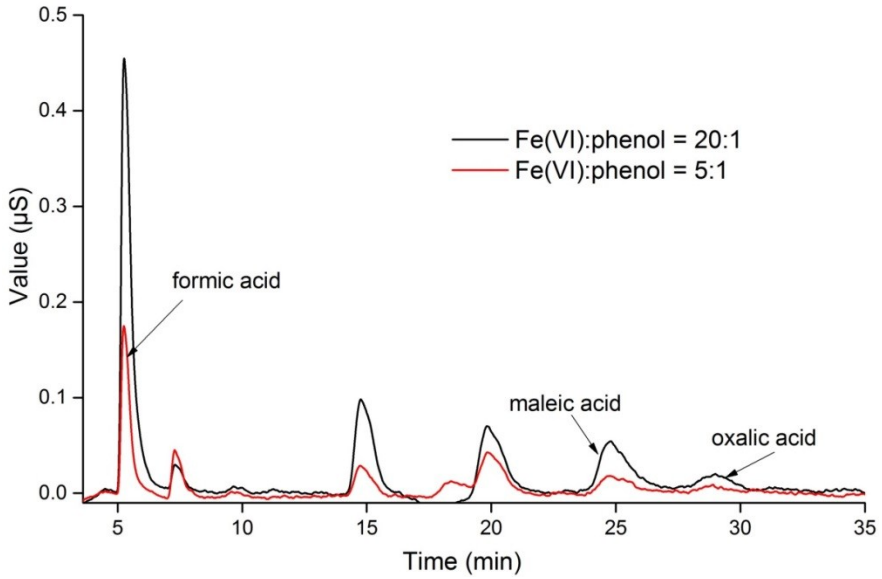

Fig. S5 IC chromatograms of various intermediates with different Fe(VI) dosage after phenol degradation by Fe(VI). Experimental conditions: [phenol] = 0.1 mM, [Cl^-] = 0 M, reaction time = 45 min, pH = 9.

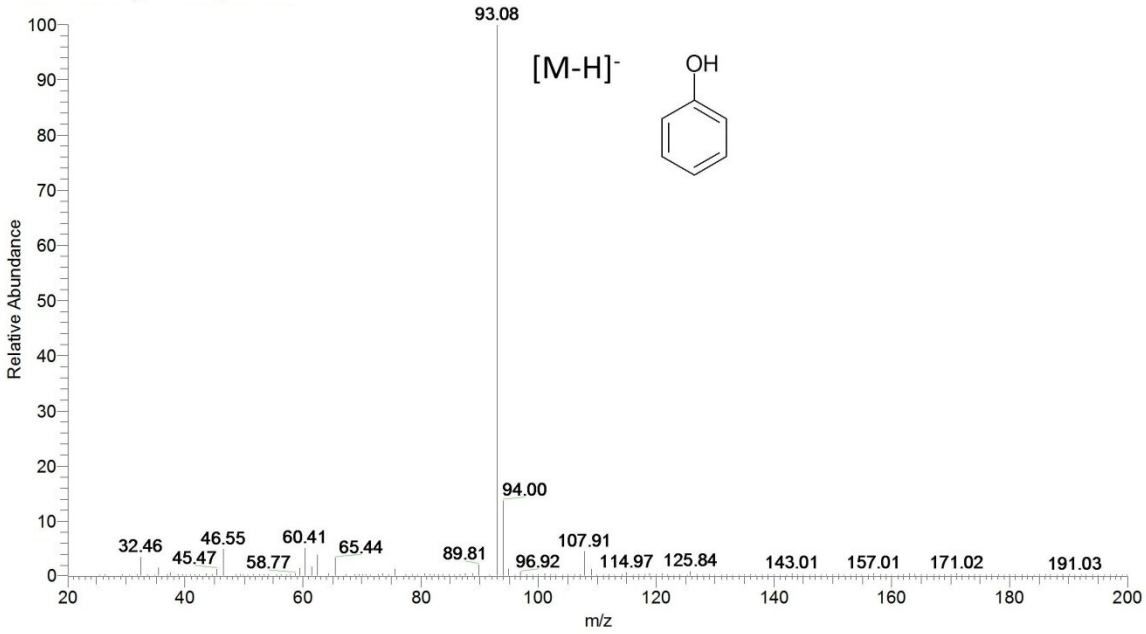

Fig. S6. MS spectrum of phenol (m/z = 93) obtained from online EESI-MS analysis before addition of Fe(VI)

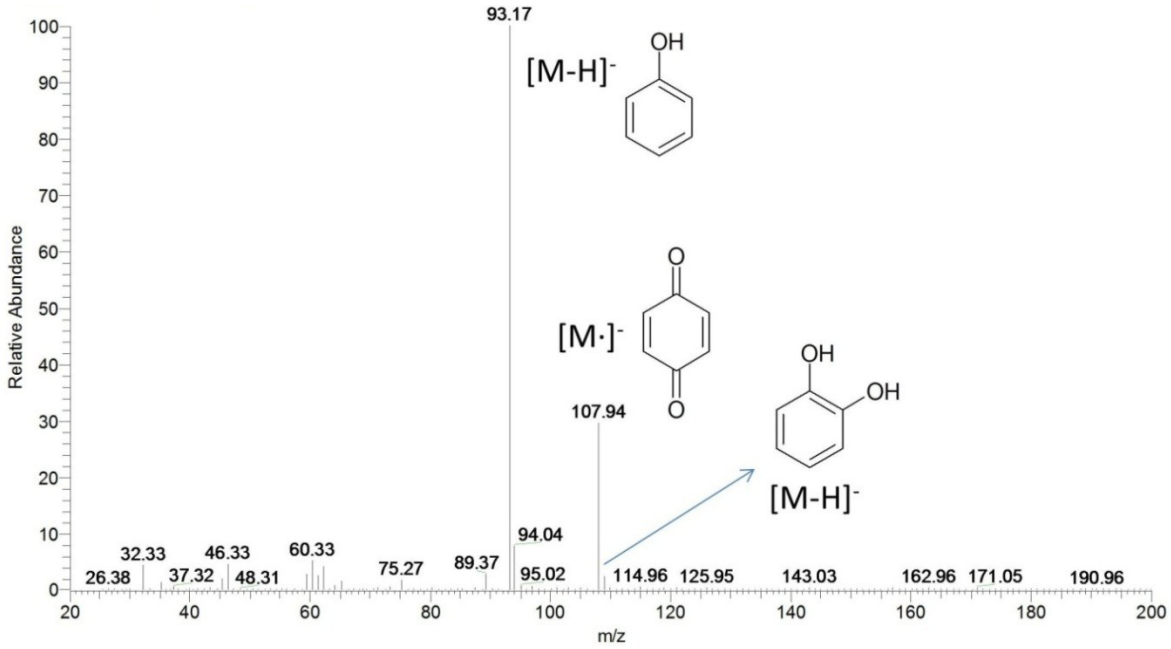

Fig. S7. MS spectrum of phenol (m/z = 93) obtained from online EESI-MS analysis at t=1.5 min after addition of Fe(VI)

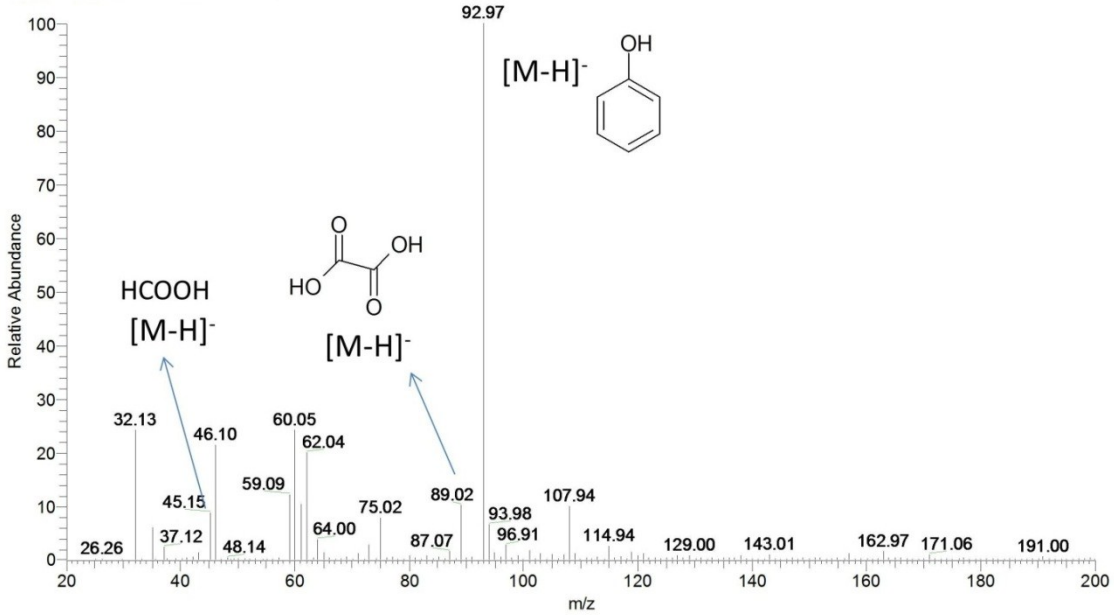

Fig. S8. MS spectrum of phenol (m/z = 93) obtained from online EESI-MS analysis at t=5 min after addition of Fe(VI)

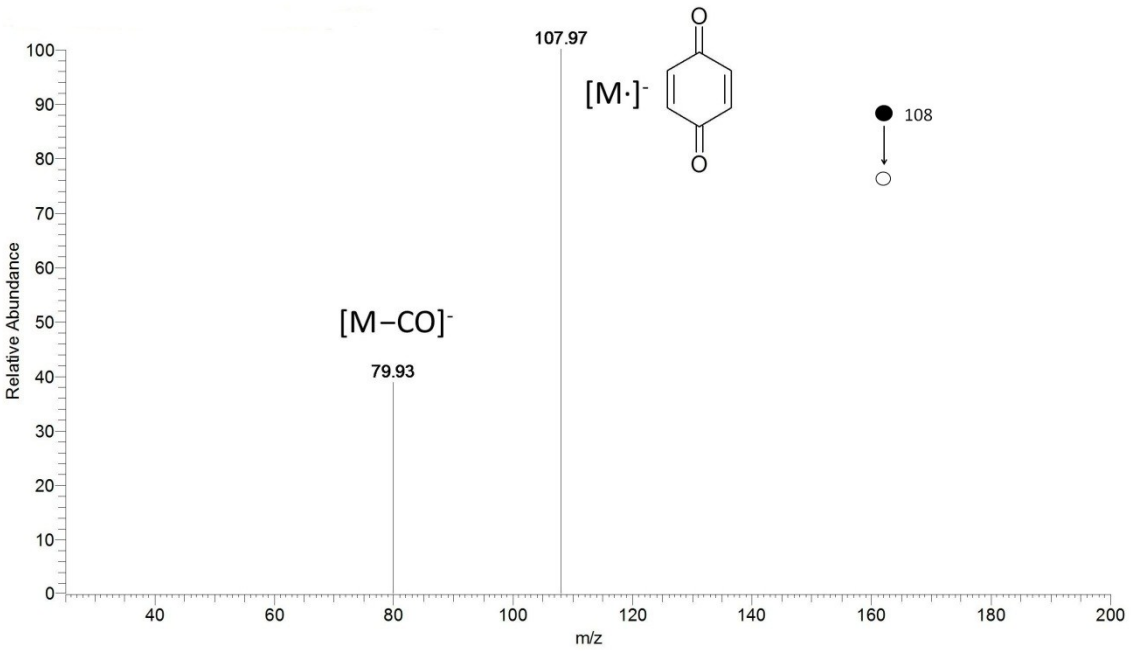

Fig. S9. MS^2 spectrum of *p*-benzoquinone (m/z = 108) obtained from online EESI-MS analysis. The m/z at 108.0 yielded the characteristic fragment of m/z at 80 by losing CO.

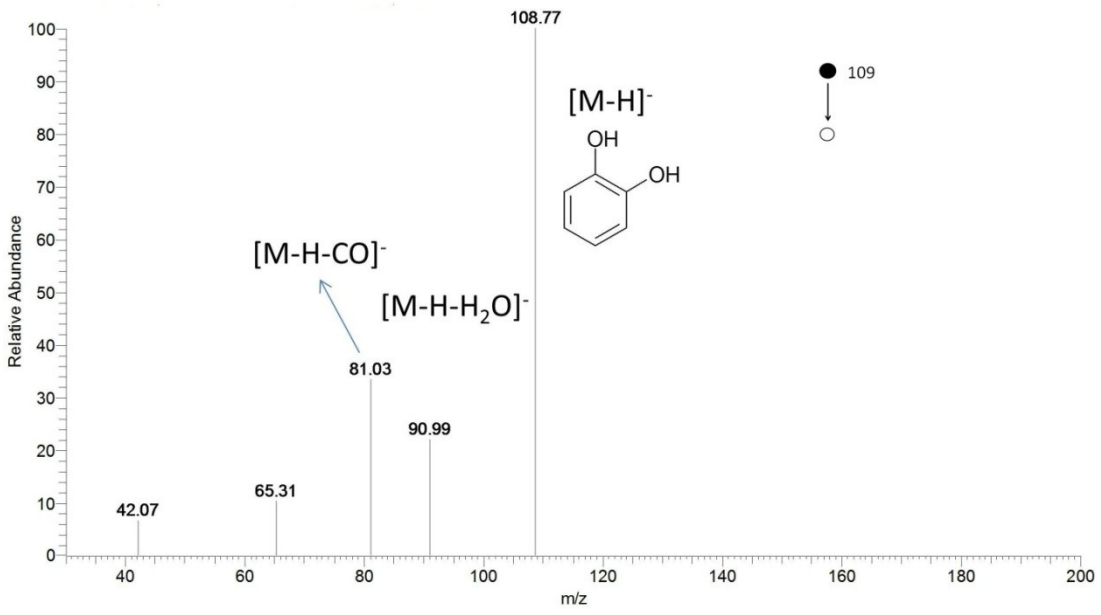

Fig. S10. MS^2 spectrum of catechol (m/z = 109.0) obtained from online EESI-MS analysis. The m/z at 109.0 yielded the characteristic fragment of m/z at 81 and 91 by losing CO and H_2O respectively.