Electronic Supplementary Material (ESI) for Analytical Methods.
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Supplementary Information for

Quantitative detection of hydroxyl radicals in Fenton system by UV-Vis spectrophotometry

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In these experiments, the expected concentration of MSIA was 100mM, and FBBs/MSIA=50. $FeSO_4 \cdot 7H_2O$ and the cations or anions was added before extraction, and the concentration of $FeSO_4$ in the systems was 200mM. The extraction time was 300s. $Fe_2(SO_4)_3$, Na_2SO_4, K_2SO_4 were adopted to examine the influence of Fe^{3+}, Na^+, K^+ on the test, and $Fe(NO_3)_2$, $FeCl_2$ were adopted to examine the influence of NO_3^-, Cl^- on the test. However, high concentration of $Fe_2(SO_4)_3$ made the solution muddy, $Fe(NO_3)_3$ was used to instead of $Fe_2(SO_4)_3$ when we examined the influence of Fe^{3+} at the concentration of 20mM. The influence of NO_3^-, Cl^- on the test is shown in Fig. S1 and the influence of on the test is shown in Fig. S2.

It can be seen from Fig. S1 that NO_3^- does not have an obvious influence on the test result of diazosulfones, even though the concentration of NO_3^- is 20mM. Cl^- does not have an obvious influence on the test when the concentration of Cl^- is low(500μM), however, the absorbance of diazosulfones(425nm) disappears when the concentration of Cl^- is 20mM. Consequently, the modified method is not appropriate for the system contains high concentration of Cl^-.

From Fig. S2, it can be seen that Na^+ and K^+ do not affect the test result of diazosulfones obviously, even though the concentrations of Na^+ and K^+ are 20mM. Low concentration of Fe^{3+} does not have an obvious influence on the test, however, high concentration of Fe^{3+} leads to the increase of extraction time, and the absorption peak keeps 425nm. The absorbance of diazosulfones with extracting 480s after adding 20mM of Fe^{3+} is the same as that with extracting 300s before adding Fe^{3+}. When we tested ·OH concentration in Fenton system, the concentration of Fe^{3+} was equal to that of ·OH. After the addition of 20.00mL of H_2O_2(250μM) in to 80.00mL of Fe^{2+}/DMSO solution, the final concentrations of Fe^{3+} were expected to be 50.0μM. under this circumstance, Fe^{3+} did not have an obvious influence on the test.

$$Fe^{2+}+H_2O_2 \rightarrow Fe^{3+}+\cdot OH+OH^-$$

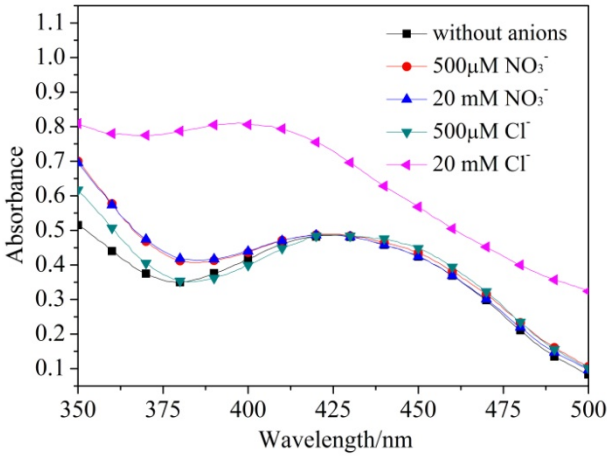

Fig. S1 Influence of NO_3^-, Cl^- on the test

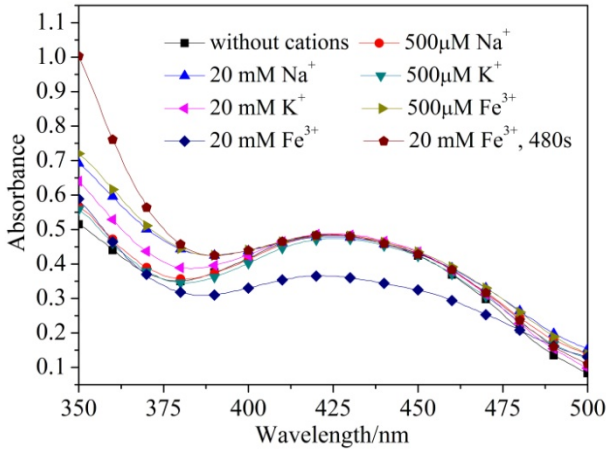

Fig. S2 Influence of Fe^{3+}, Na^{+}, K^{+} on the test