

Electronic Supplementary Material

Title: "Removal of nitric oxide from simulated flue gas using aqueous persulfate with activation of ferrous ethylenediaminetetraacetate in the rotating packed bed"

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1. Material balance of NO

According to the simulated flue gas conditions, in which the flue flow gas is 1 m³/h, the volume of solution is 4.5 L, and the concentration of NO is 500 ppm, the absolute amounts of NO in 300 s is 51 mg, respectively. Considering the achieved removal efficiencies in the system was 75.9% for NO, the removed amounts 38.7 mg of NO were obtained. Meanwhile, the molar masses of removed NO was calculated to be 1.29 mmol.

As shown in Table 1, the concentration of NO₃⁻ is 18.22 mg/L, respectively. The molar masse of NO₃⁻ in the solution was calculated to be about 1.32 mmol. It can be found that there is little difference between the nitrogen species of 1.32 mmol and the theoretical value of 1.29 mmol, indicating that the NO is all oxidized into NO₃⁻.

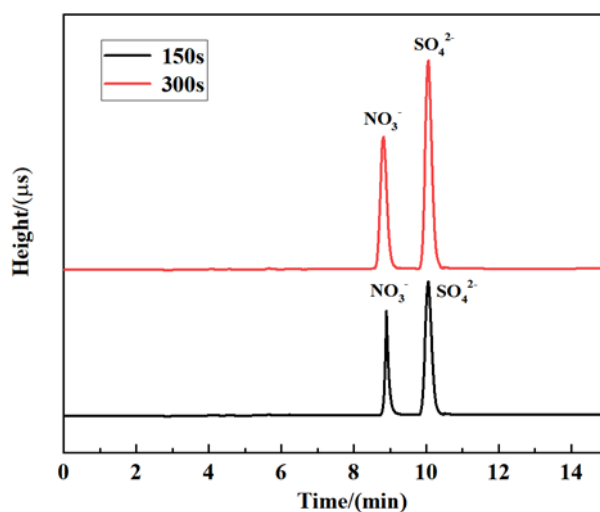


Fig. S1 Ion chromatograms of the removal products.

2. The electron paramagnetic resonance spectrometer experimental results

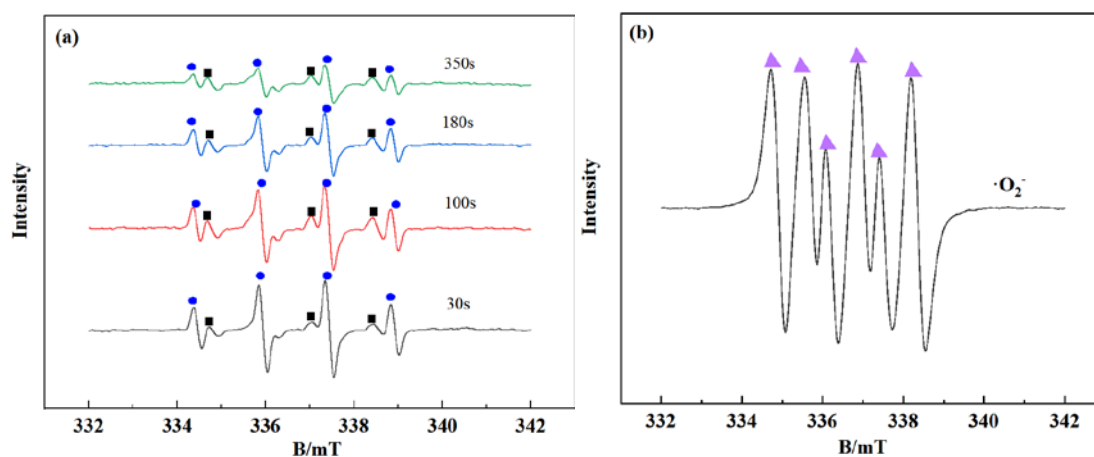


Fig. S2 EPR spectrometer of free radicals trapping by DMPO are shown in the RPB/PS/ Fe^{2+} - EDTA system: (a) Changes of $\bullet\text{SO}_4^-$ and $\bullet\text{OH}$ in different time periods, (b) Capture of $\bullet\text{O}_2^-$ by EPR spectrometer. The measurements were carried out microwave power of 10 mW, modulation amplitude of 0.2 mT, resonance frequency of 9.47, modulation frequency of 100 kHz and sweep time of 60 s. (the rectangle represents DMPO- SO_4^- , the circle represents DMPO-OH, the triangle represents DMPO- O_2^-).

3. Schematic diagram of NO removal mechanism in RPB/ Fe^{2+} -EDTA/PS system

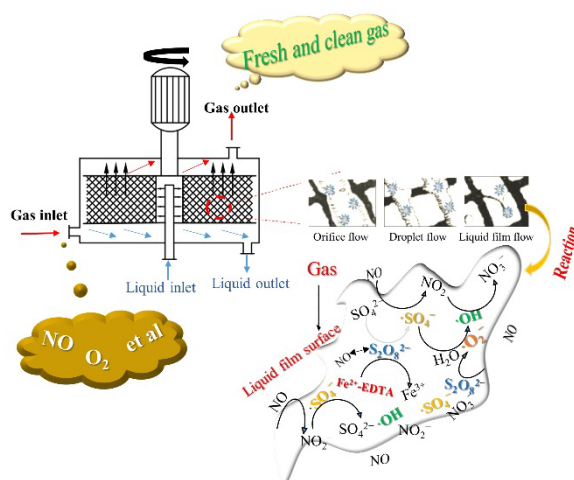


Fig. S3 Removal mechanism of NO in RPB/ Fe^{2+} -EDTA/PS system