

## SUPPORTING INFORMATION

### **Efficient removal of 17 $\alpha$ -ethinylestradiol (EE2) from water using freshly formed Fe–Mn binary oxide**

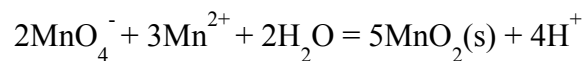
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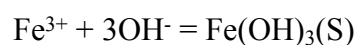
## **Text S1 The preparation of MnO<sub>2</sub> and FeOOH**

### 1. The preparation of MnO<sub>2</sub>:



1 L of DI-water was sparged with N<sub>2</sub> gas for about 1 hour in a large beaker at first. 180 ml of the sparged water was removed to prepare solutions: 40 ml 0.1 M KMnO<sub>4</sub>, 80 ml 0.1 M NaOH and 60 ml 0.1 M MnCl<sub>2</sub>. After solution preparing, 40 ml 0.1 M KMnO<sub>4</sub> and 80 ml 0.1 M NaOH were added to 0.82 L of N<sub>2</sub>-sparged reagent water and sparged this solution with N<sub>2</sub> gas for another half an hour. Then 60 mL 0.1 M MnCl<sub>2</sub> was added dropwise into the solution while keeping the solution constantly stirred. After addition, the solution was continuously stirred for another half an hour. The formed MnO<sub>2</sub> particles were filtered and rinsed repeatedly with deionized water until the conductivity was < 2 μS cm<sup>-1</sup>, then dried at 105°C for 4 h. The dry material was crushed and stored in a desiccator.

### 2. The preparation of FeOOH:



100 ml 0.5 M FeCl<sub>3</sub> and 300 ml 0.5 M NaOH were prepared first. Then 100 ml 0.5 M FeCl<sub>3</sub> was added slowly into the NaOH solution under vigorous magnetic-stirring. After addition, the suspension was kept stirring for another hour and aged at room temperature for 4 h. The formed FeOOH particles were filtered and rinsed repeatedly with deionized water until the conductivity was < 2 μS cm<sup>-1</sup>, then dried at 105°C for 4 h. The dry material was crushed and stored in a desiccator.