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Supporting information

Degradation of different wastewater by biological sponge iron system: microbial growth and influencing factors

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Figure S1

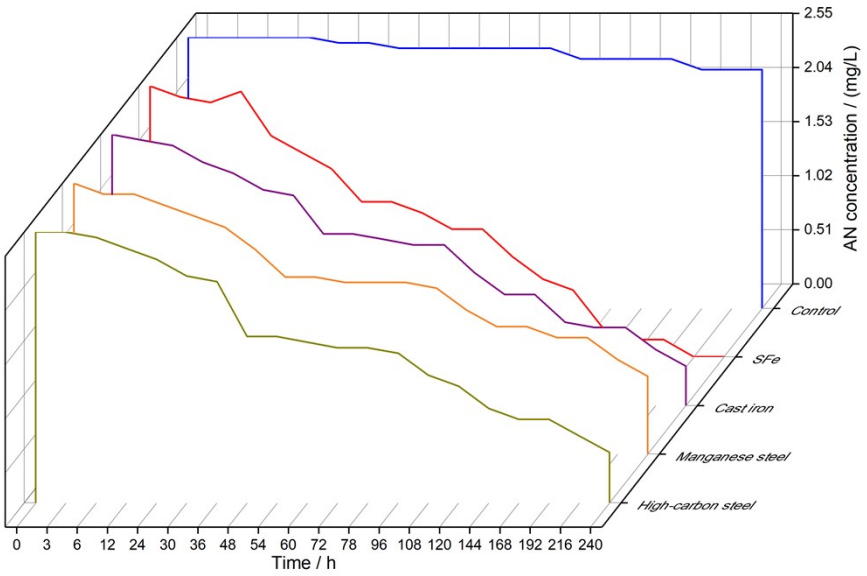

Fig. S1 The treatment efficacy of various types of ZVI on aniline wastewater.

Figure S2

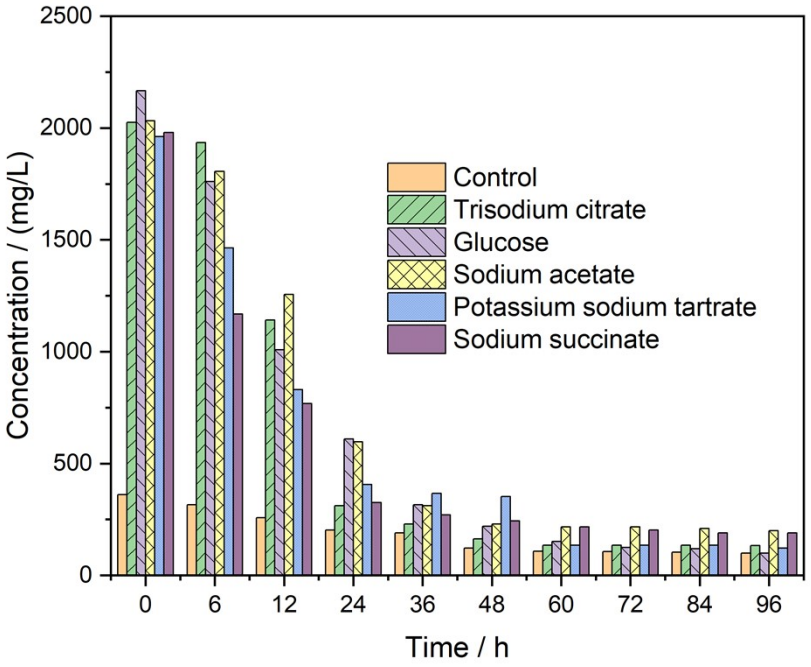

Fig. S2 Effects of carbon sources on nitrogen-containing wastewater.

Text S1

SFe-M method was employed to treat nitrogen-containing (NC), aniline (AN), and nitrobenzene (NB) wastewater in our laboratory, respectively. Among them, two cylindrical SBBR with a working volume of 4 L was conducted to treat 45 mg/L NC and 600 mg/L AN. NB (300 mg/L) degradation experiment was carried out in a 500 mL conical flask with a working volume of 300 mL as the SFe-M reactor. These three reactors were filled with 90 g/L SFe and the mixed liquor suspended solids (MLSS) were kept at about 4000-5000 mg/L. The reactors have been steadily operated for more than 3 months. The reactors operated at ambient temperature with 12 h cycle model following 15 min feeding, 11 h aeration, 30 min settling, and 15 min effluent discharge. The volumetric exchange ratio of the reactors was 50 %.

Text S2

The isolation of functional strains was carried out in the autoclaved medium. Add a certain amount of NC (320 mg/L $(NH_4)_2SO_4$ and 2000 mg/L glucose), AN (600 mg/L), and NB (300 mg/L) to the inorganic salt medium to obtain the NC medium, AN medium and NB medium, respectively. $(NH_4)_2SO_4$ and glucose as the carbon and nitrogen sources in the NC medium, while AN and NB as the sole carbon and nitrogen sources in the AN medium and NB medium. All purified strains were inoculated on the nutrient agar medium for subsequent experiments.

The inorganic salt medium consisted of 3.8 g/L $Na_2HPO_4 \cdot 12H_2O$, 1.0 g/L KH_2PO_4, 1.0 g/L NaCl, 0.2 g/L $MgSO_4 \cdot 7H_2O$, pH 7.0~7.2. The BTB medium consisted of 1 g/L KNO_3, 1 g/L KH_2PO_4, 0.5 g/L $FeCl_2 \cdot 6H_2O$, 0.2 g/L $CaCl_2 \cdot 7H_2O$, 1 g/L $MgSO_4 \cdot 7\ H_2O$, 8.5 g/L succinic acid disodium salt, 1 mL indicator solution bromothymol blue (0.1 g bromothymol blue dissolved in 10 mL alcohol), pH 7.0-7.3. The DM medium consisted of 0.72 g/L KNO_3, 1 g/L KH_2PO_4, 1 g/L $MgSO_4 \cdot 7H_2O$, 2.8 g/L succinic acid disodium salt. The nutrient agar medium consisted of 10 g/L peptones, 3 g/L beef extract, 5 g/L NaCl, 15~20 g/L agar, pH 7.4-7.6. The pH of the medium was adjusted by using 0.1 M HCl or 0.1 M NaOH before autoclaving at 121 °C for 20 min.