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# **Supporting Information**

## One-pot hydrothermal synthesis of

### hematite-reduced graphene oxide composites

### for efficient removal of malachite green from aqueous solution

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#### Effects of initial pH for adsorption

The effects of initial pH values on the adsorption of MG are shown in Figure S1. The results indicate that the dye adsorption onto the  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>-rGO is dependent to pH value. At strong acid condition (pH=3), the adsorption capacity of MB is small. The adsorption capacities increased with pH increasing. The proper pH range for adsorption occurred at pH 6-10. The best pH for MG adsorption is neutral. So all the experiments in the study are done in deionized water without special pH control.

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Fig. S1. Effect of different pH values on adsorption of MG. ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>-rGO dosage=0.2 g.L<sup>-1</sup>, C<sub>MG</sub> =100 mg.L-1, initial pH=3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0)