Supplementary Information

Malachite green Adsorption onto Fe_3O_4@SiO_2-NH_2: Isotherms, Kinetic and Process Optimization

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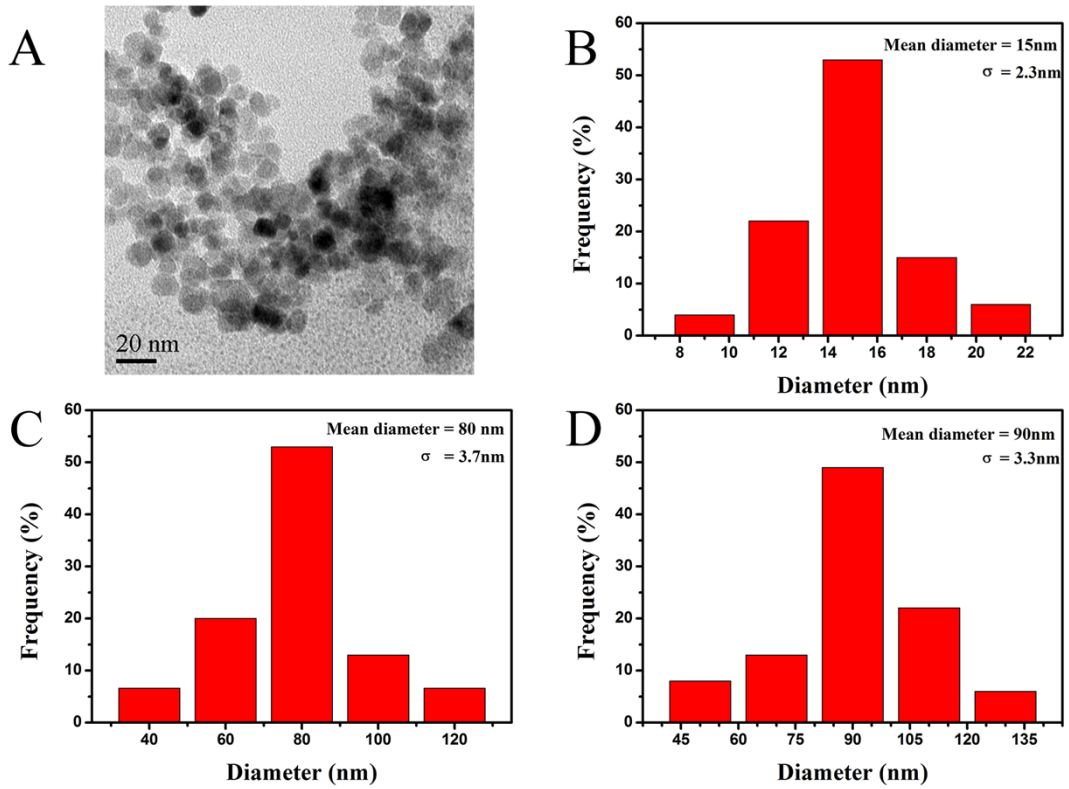

Figure S1. TEM image of Fe_3O_4 (A), size distribution histogram of Fe_3O_4 (B), Fe_3O_4@SiO_2 (C), and Fe_3O_4@SiO_2-NH2 (D).

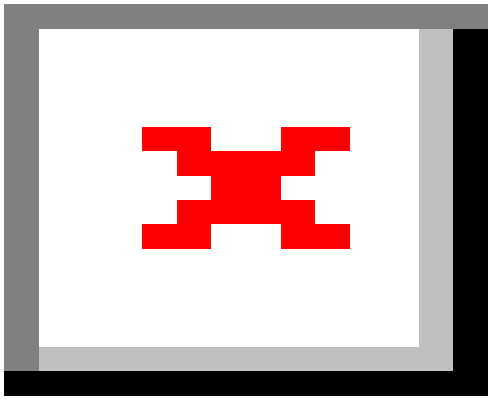

Figure S2. The number distribution histogram of Fe_3O_4 nanoparticles at the core of the composite particles.

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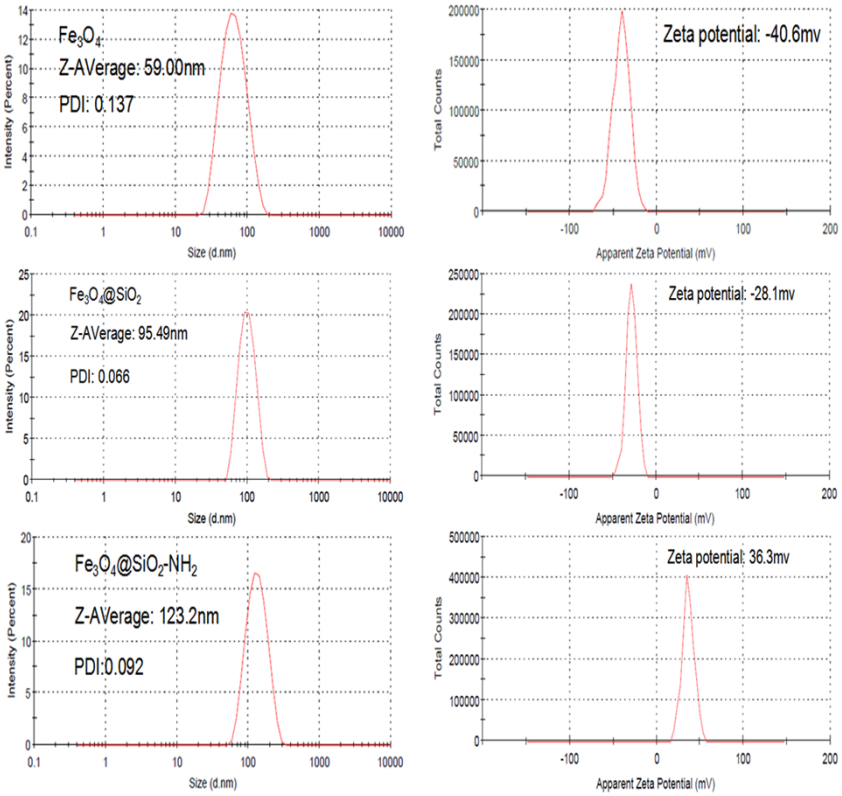

Figure S3. Dynamic light scattering measurements of Fe_3O_4, Fe_3O_4@SiO_2, Fe_3O_4@SiO_2-NH_2.

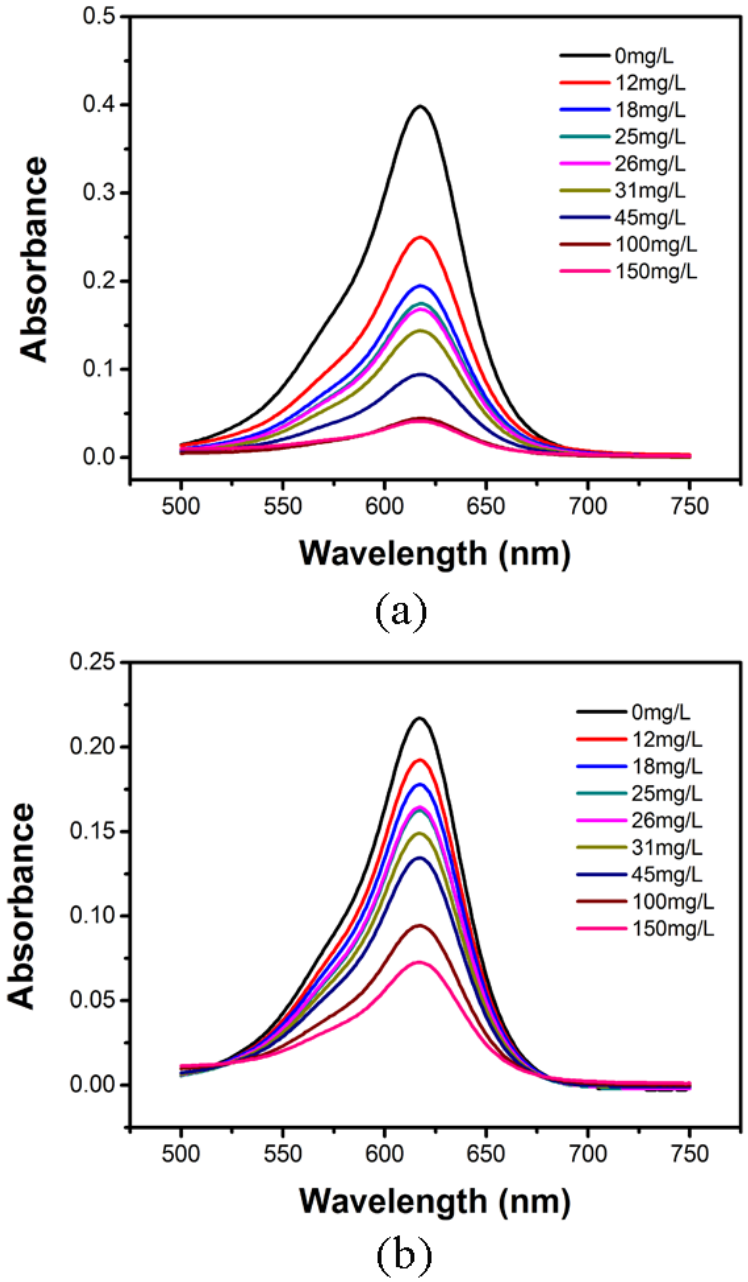

Figure S4. The UV–vis absorption of the malachite green (10mg/L) using the Fe_3O_4@SiO_2-NH_2 (a) and Fe_3O_4@SiO_2 (b).

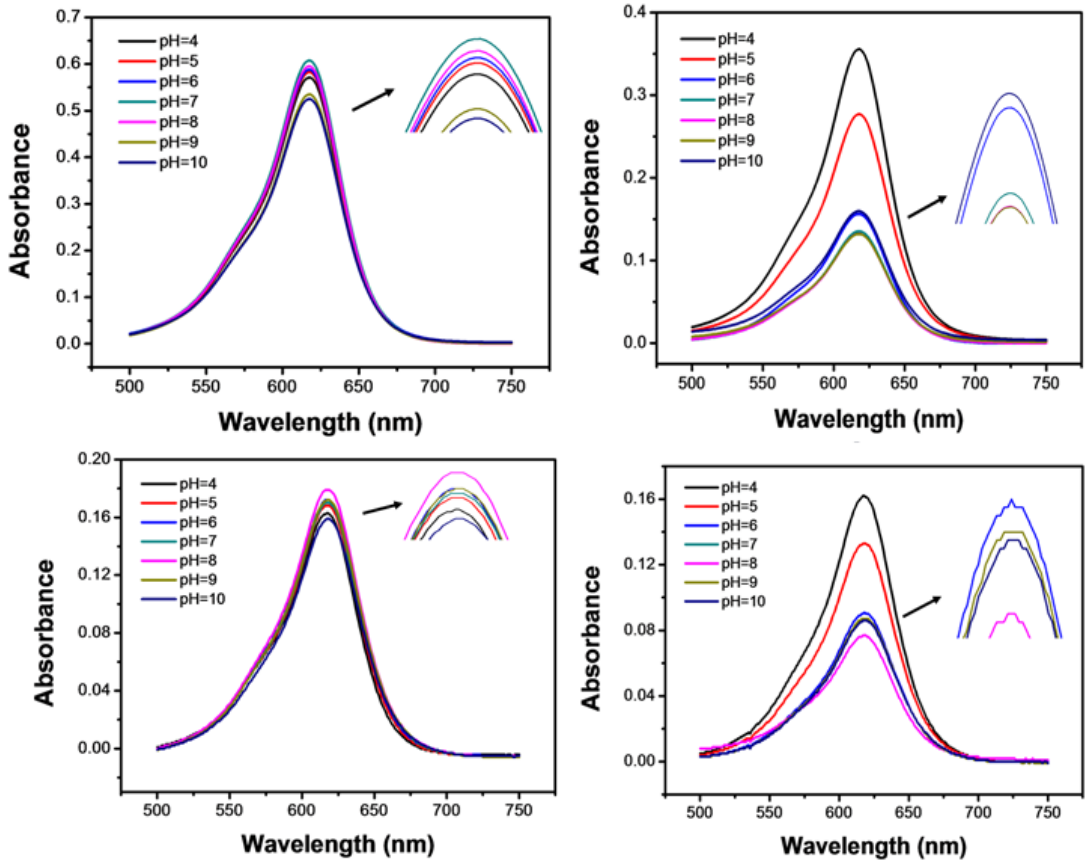

Figure S5. The UV-vis absorption of the malachite green before (left) and after (right) adsorption by the Fe_3O_4@SiO_2-NH_2 (a) and Fe_3O_4@SiO_2 (b).

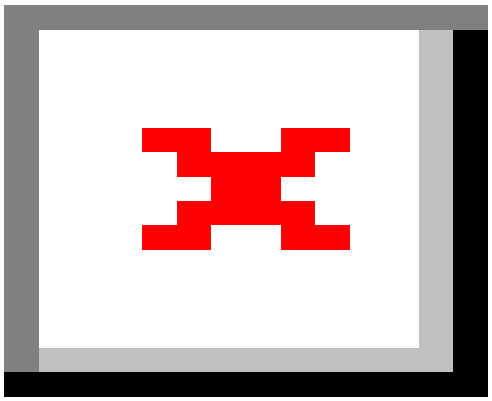

Figure S6. The Zeta-potential value of Fe_3O_4@SiO_2-NH_2 and Fe_3O_4@SiO_2 varying with pH.

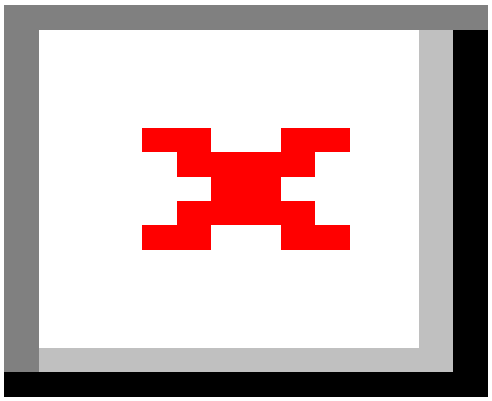

Figure S7. The effect of CTAB，SDS and Tween-20 on the adsorption ability. The concentration of surfactant were 0.02M.

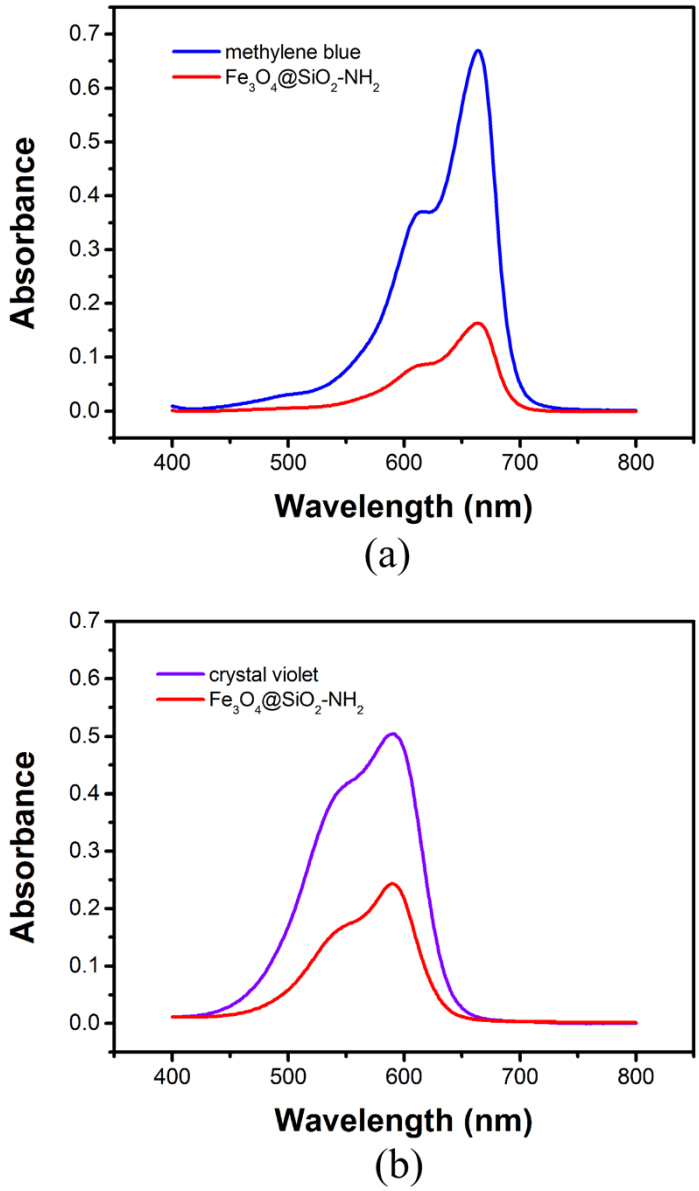

Figure S8. Adsorption by $Fe_3O_4@SiO_2$-NH_2 of (a) methylene blue and (b) crystal violet dissolved in Yangtze River water. The concentration of $Fe_3O_4@SiO_2$-NH_2 was 100mg/L and the initial concentration of dye solution was 10 mg/L.

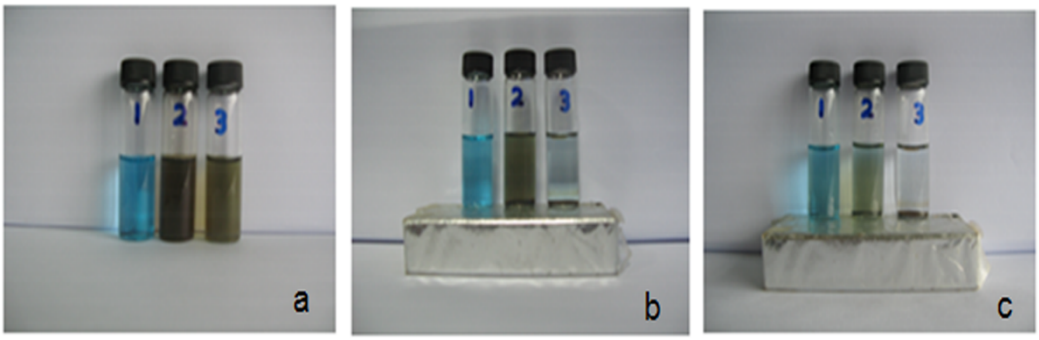

Figure S9. Magnetic separation behavior of (a) at 0 hours, (b) after 30mins, (c) after 12 hours. (1) MG, (2) Fe_3O_4@SiO_2, (3) Fe_3O_4@SiO_2-NH_2.

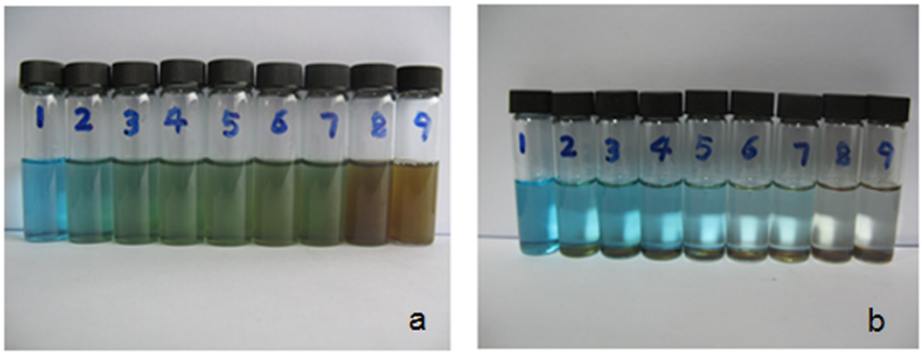

Figure S10. Magnetic separation behavior of (a) at 0mins, (b) after 30mins. From 1-9 is the concentration of Fe_3O_4@SiO_2-NH_2 (0mg/L, 12mg/L, 18mg/L, 25mg/L, 26mg/L, 31mg/L, 45mg/L, 100mg/L, 150mg/L)