Electronic Supplementary Information

Graphene oxide/chitosan composite hydrogels as broad-spectrum adsorbents for water purification

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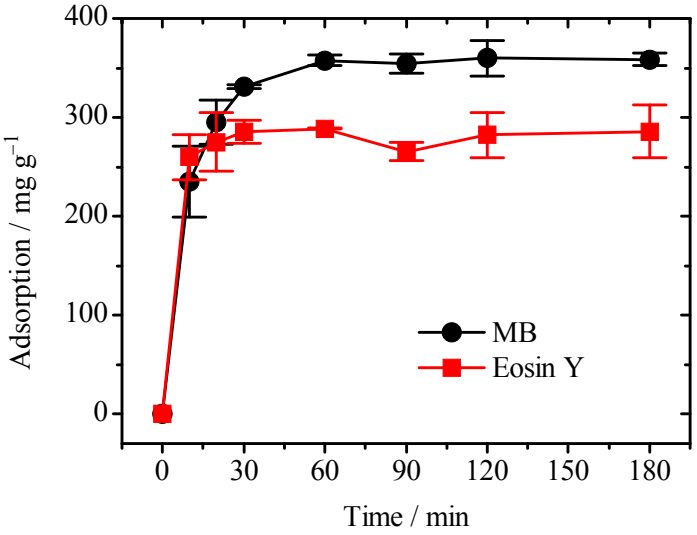

Fig. S1. Time-dependent adsorption of MB and Eosin Y on comminuted GO/CS10 hydrogel under agitation.

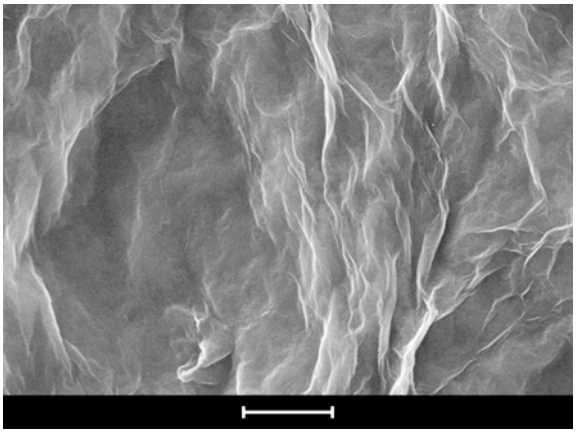

Fig. S2. SEM image of compact GO/CS composite prepared by drying GO/CS10 hydrogel in air. Scale bar: 5 μm.

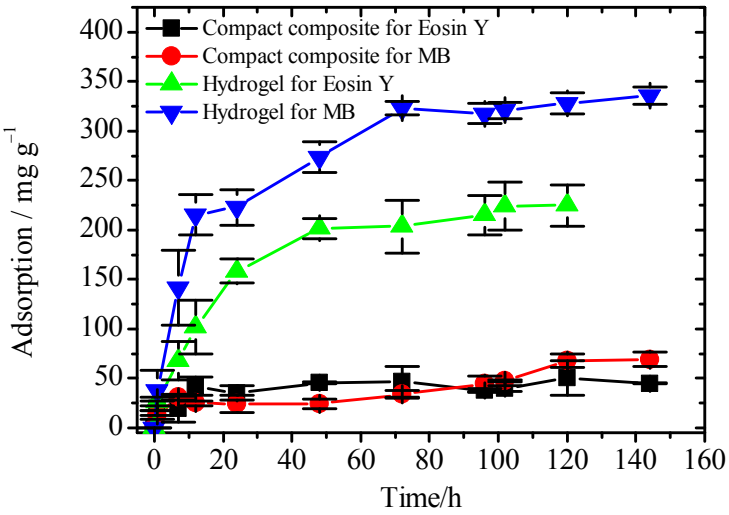

Fig. S3. Time-dependent adsorption of Eosin Y and MB on GO/CS10 hydrogel and corresponding compact composite.

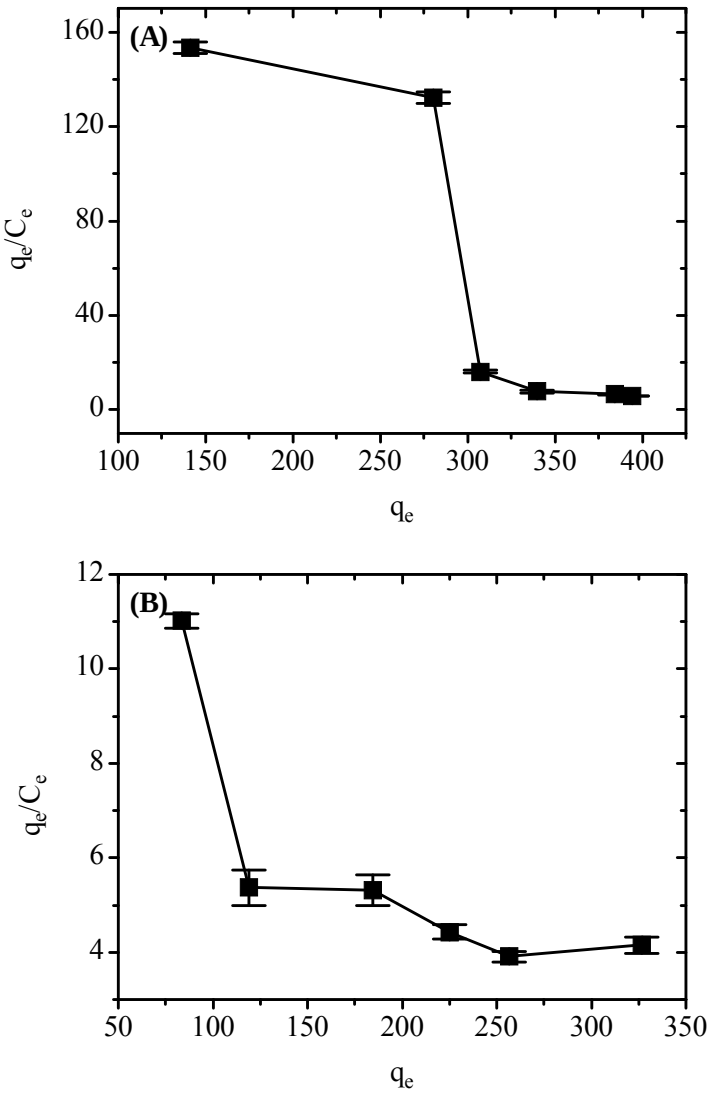

Fig. S4. Analysis of adsorption data of MB (A) and Eosin Y (B) on GO/CS with Langmuir Function.

The Langmuir isotherm can be expressed as

$$q_e = \frac{aq_sC_e}{1+aC_e}$$

where q_s is the maximum adsorption capacity and a is a conatant. This equation can be expressed in linear form:

$$\frac{q_e}{C_e} = aq_s - aq_e$$

The plots of q_e/C_e to q_e are nonlinear for both dyes, indicating the isotherms are not of Langmuir type.

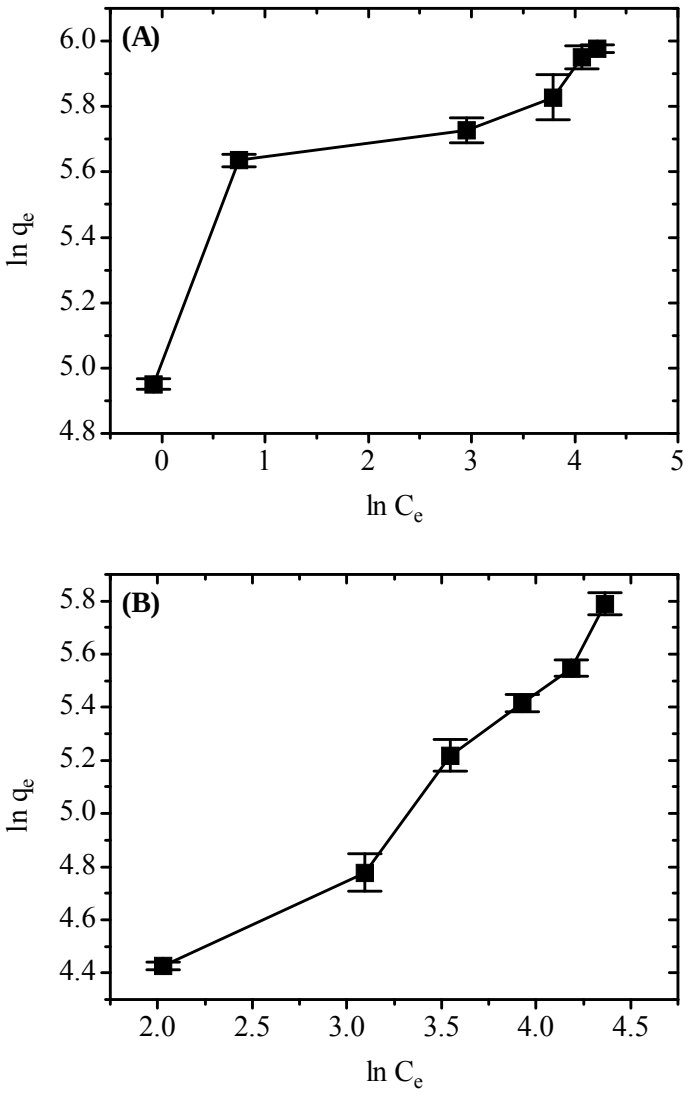

Fig. S5. Analysis of adsorption data of MB (A) and Eosin Y (B) on GO/CS with Freundlich Function.

The Freundlich isotherm can be expressed as

$$q_e = KC_e^{\frac{1}{n}}$$

where K and n are constants. This equation can be expressed in linear form:

$$\ln q_e = \ln K + \frac{1}{n} \ln C_e$$

The plots of $\ln q_e$ to $\ln C_e$ are nonlinear for both dyes, indicating the isotherms are not of Freundlich type.

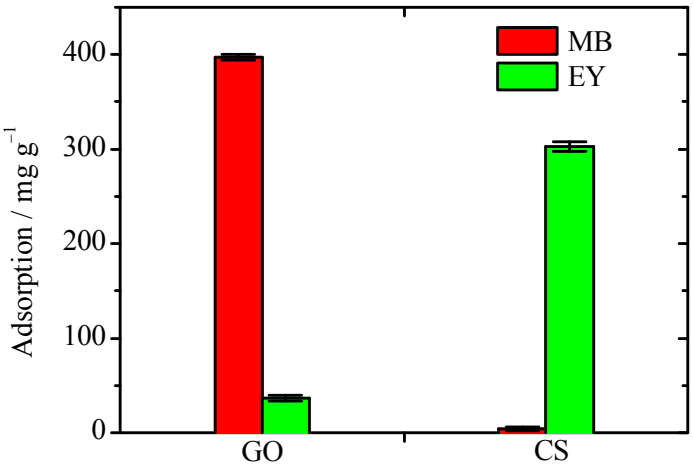

Fig. S6. Adsorption of MB and Eosin Y on pure GO and CS. The initial concentration of the dyes is 80 mg L−1.

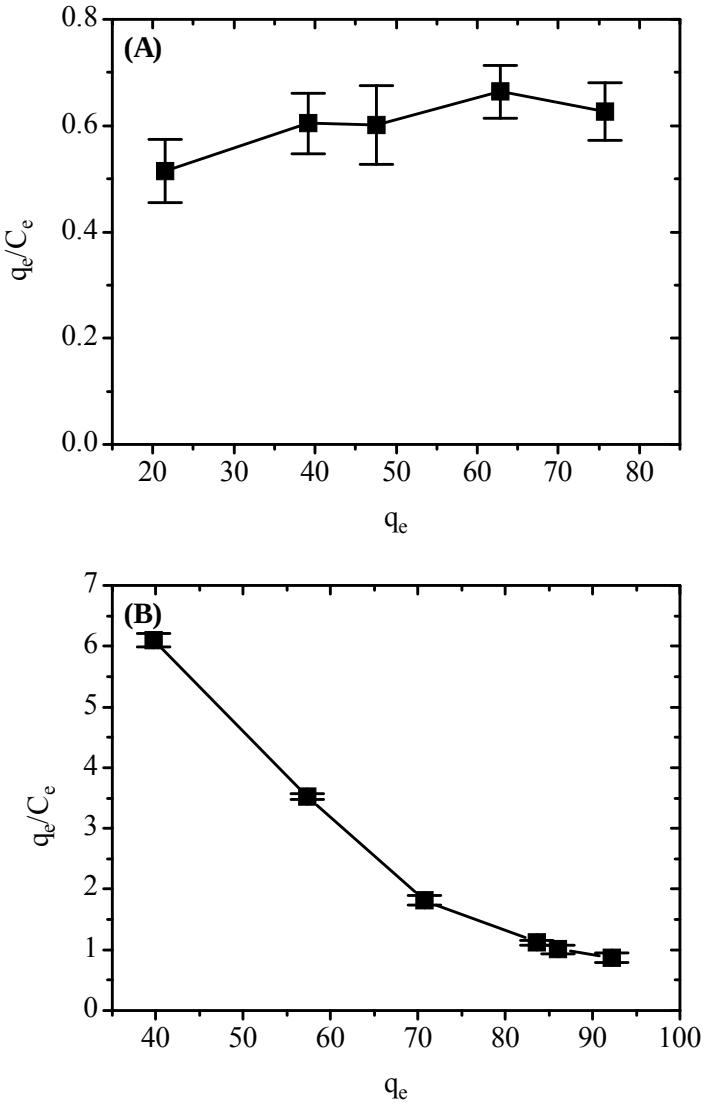

Fig. S7. Analysis of adsorption data of Cu(II) (A) and Pb(II) (B) on GO/CS with Langmuir Function.

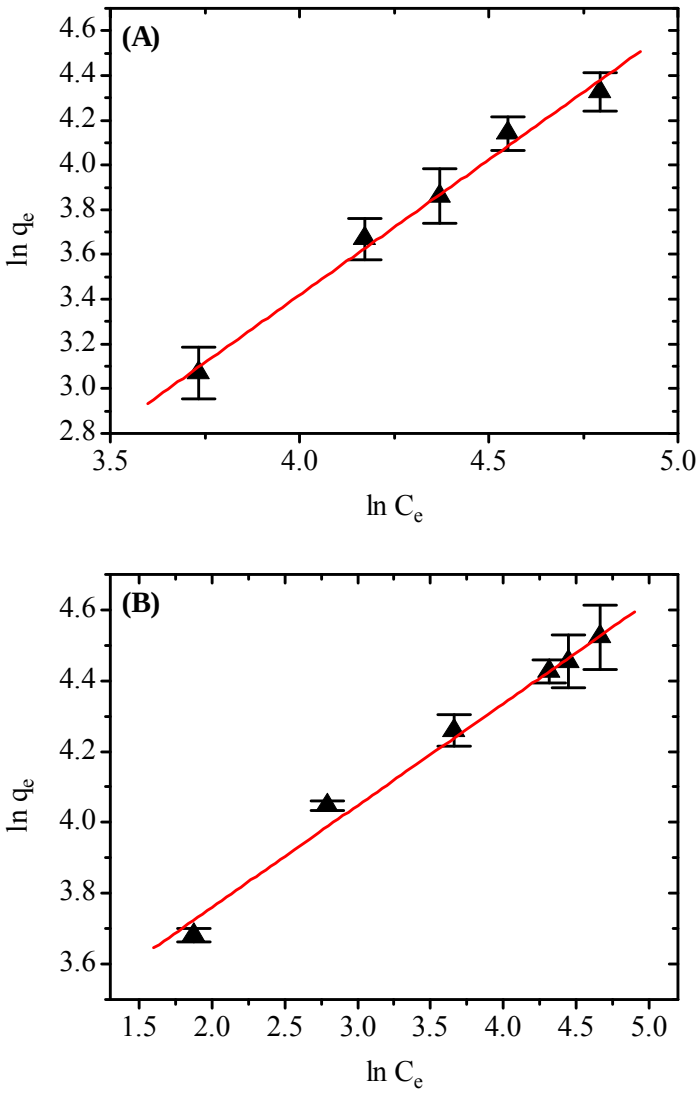

Fig. S8. Analysis of adsorption data of Cu(II) (A) and Pb(II) (B) on GO/CS with Freundlich Function.

For Cu(II):

Fitting of the data gives $\ln q_e = -1.42 + 1.21 \ln C_e$ with $r^2 = 0.99$, thus $K = 0.24$ and n = 0.826.

For: Pb(II)

Fitting of the data gives $\ln q_e = 3.19 + 0.29 \ln C_e$ with $r^2 = 0.99$, thus $K = 24.3$ and n = 3.45.

n value for Cu(II) is much lower than that for Pb(II), indicating that the affinity of GO/CS10 hydrogel to Cu(II) is smaller than to Pb(II).