Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information on

Reusable Colloidal Graphene Oxide Suspensions Combined with Dialysis Bag for Recovery of Trace Y(III) from Aqueous Solutions

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Supporting Information : 4 Pages including 3 Figures and 1Table

Preparation of colloidal graphene oxide supensions. Colloidal graphene oxide suspension was synthesized by using modified Hummer method. In a typical procedure, 4.00 g potassium permanganate ($KMnO_4$) and 23ml concentrated sulfuric acid (H_2SO_4) were added to a mixture of 1.00 g graphite flakes and 0.50 g $NaNO_3$ to oxidize the graphite layers under vigorous stirring in ice-water bath. The suspension was kept below 5^oC for 60 min and at 35^oC for 30min. And then 50ml of deionized water was slowly added to dilute the suspension with the temperature controlled below 50^oC. After the diluted suspension was kept at 100 ^oC for 20 min,100ml of deionized water was added under continuous stirring to obtain brownish suspension. To eliminate the superfluous $KMnO_4$, the proper amount of 30 wt% H_2O_2 was added into the suspension under continuous stirring until the color of the suspension varied from brown to bright yellow.

After repeating such purification processes as rinse with deionized water, centrifugal separation and ultrasonic dispersion, the suspension was loaded into dialysis bag and dialyzed in deionized water until the solution was neutral, and thus the stock suspension of GO was obtained, whose concentration was determined by gravimetric method. The GO suspensions for ion adsorption were prepared by diluting with deionized water according to the experimental requirements.

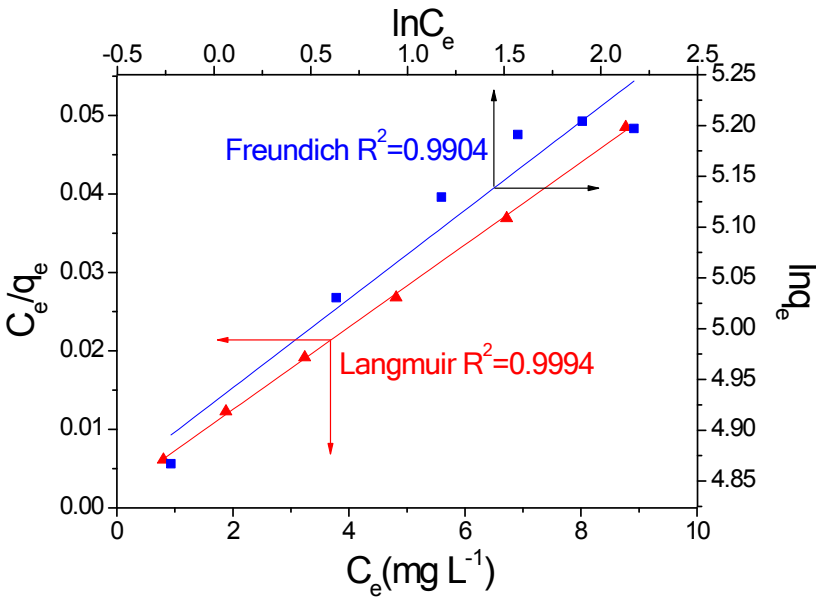

Fig. S1. Simulation of Langmuir and Freundlich isotherm adsorption models of Y(III) on GO nanosheets at 303K.

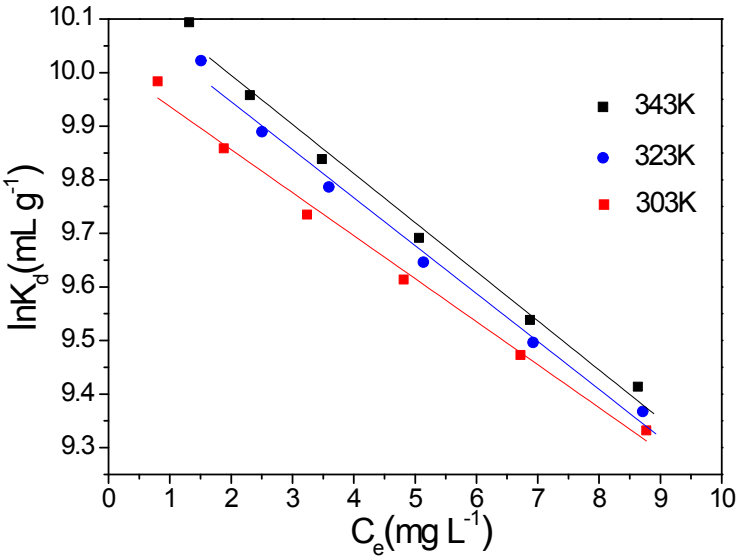

Fig. S2. Linear plots of ln K_d versus C_e for Y(III) adsorption on graphene oxide nanosheets at 303K, 323K and 343 K.. C[Y(III)]$_0$=12 μg/ml, V[Y(III)]$_0$=25 ml, V_{GO}=10 ml, C_{GO}=0.1 mg/ml, pH=5.9± 0.1.

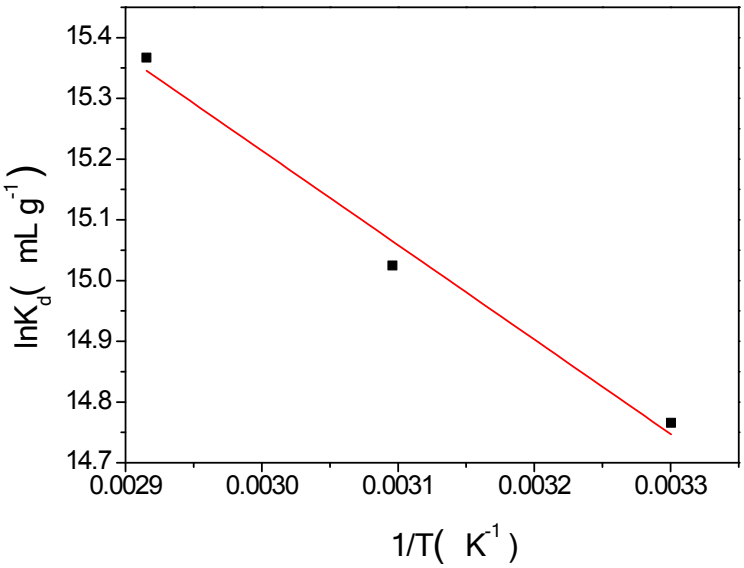

Fig.S3. Linear plots of ln K_d versus **1/T** for Y(III) adsorption on graphene oxide nanosheets at 303K, 323K and 343 K.. C[Y(III)]$_0$=12 μg/ml, V[Y(III)]$_0$=25 ml, V_{GO}=10 ml, C_{GO}=0.1 mg/ml, pH=5.9± 0.1.

Table S1. Parameters for pseudo-first-order and pseudo-second -order kinetic models of Y(III) adsorption on GO

Conditions	Pseudo-first-order		Pseudo-second-order	
Y(III)	k_1(min^{-1})	R^2	k_2 (g·mg^{-1}·min^{-1})	R^2
T=303K	0.173	0.9926	0.0014	0.9982