Supplementary Data:

α-Fe$_2$O$_3$ nanowires deposited diatomite: highly efficient absorbents for the removal of arsenic

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Content

Table S1. The As(III) and As(V) removal efficiency of the α-Fe_2O_3 nanowires/diatomite sample prepared with different $FeCl_3$ concentrations.

$FeCl_3$ concentration (wt%)	Removal efficiency (%)	
	As(III)	As(V)
0	46.51	52.73
6	83.17	90.25
8	99.98	100.00
10	96.77	98.36
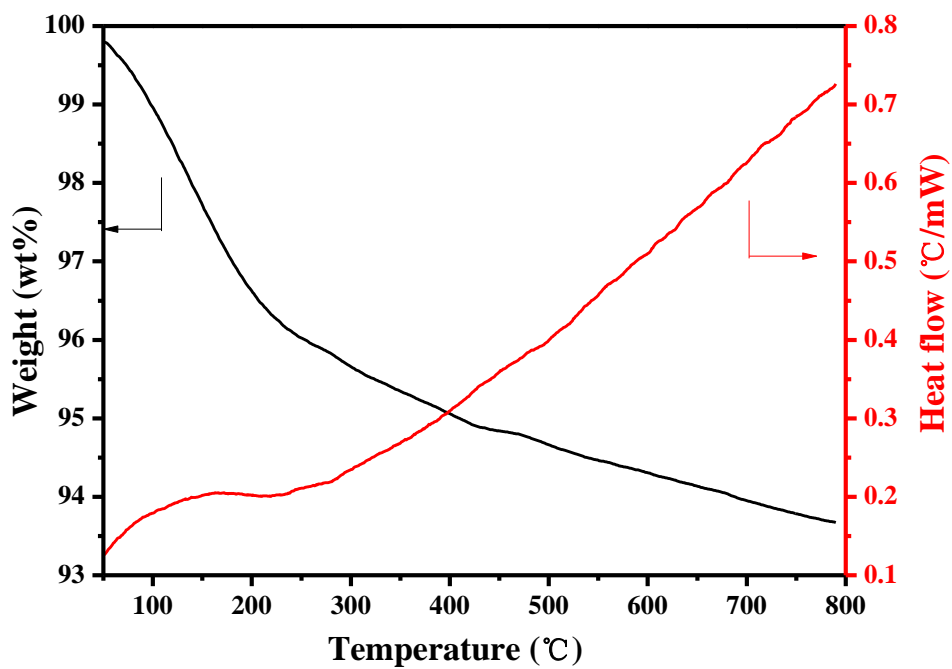
Fig. S1. TGA/DTA profiles of the α-FeOOH/diatomite sample.

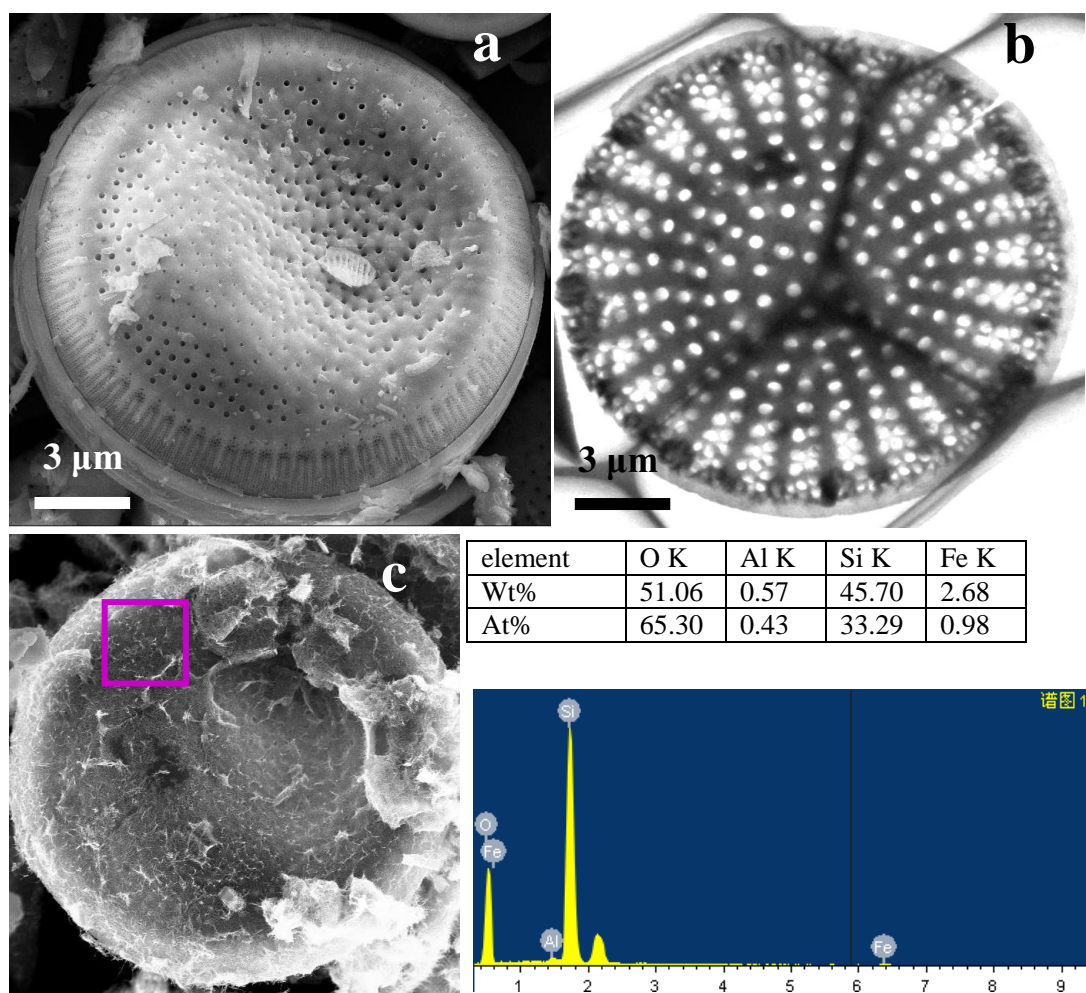| element	O K	Al K	Si K	Fe K
Wt%	51.06	0.57	45.70	2.68
At%	65.30	0.43	33.29	0.98

Fig. S2. (a) SEM and (b) TEM images of the diatomite and (c) EDS spectrum of the

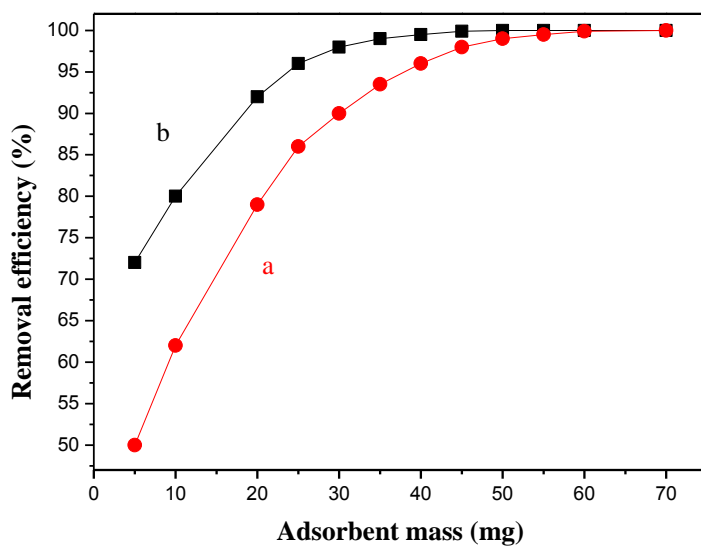α-Fe$_2$O$_3$ nanowires/diatomite sample

Fig. S3. Effect of adsorbent mass on the (a) As(III) and (b) As(V) removal efficiency of the α-Fe$_2$O$_3$ nanowires/diatomite sample at an As(III) or As(V) concentration of 10 mg/L.
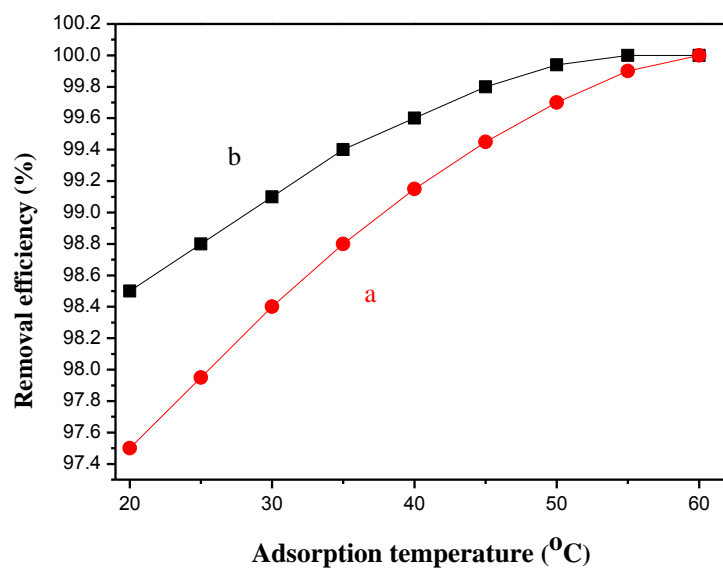
Fig. S4. Effect of adsorption temperature on the (a) As(III) and (b) As(V) removal efficiency of the α-Fe$_2$O$_3$ nanowires/diatomite sample at an As(III) or As(V) concentration of 10 mg/L.
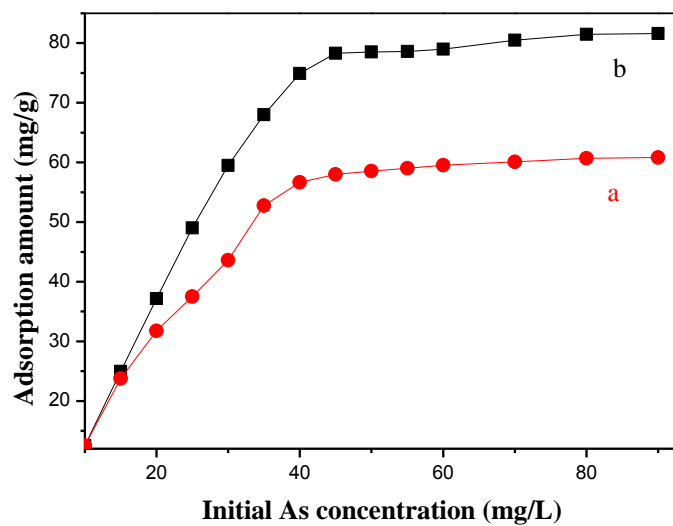
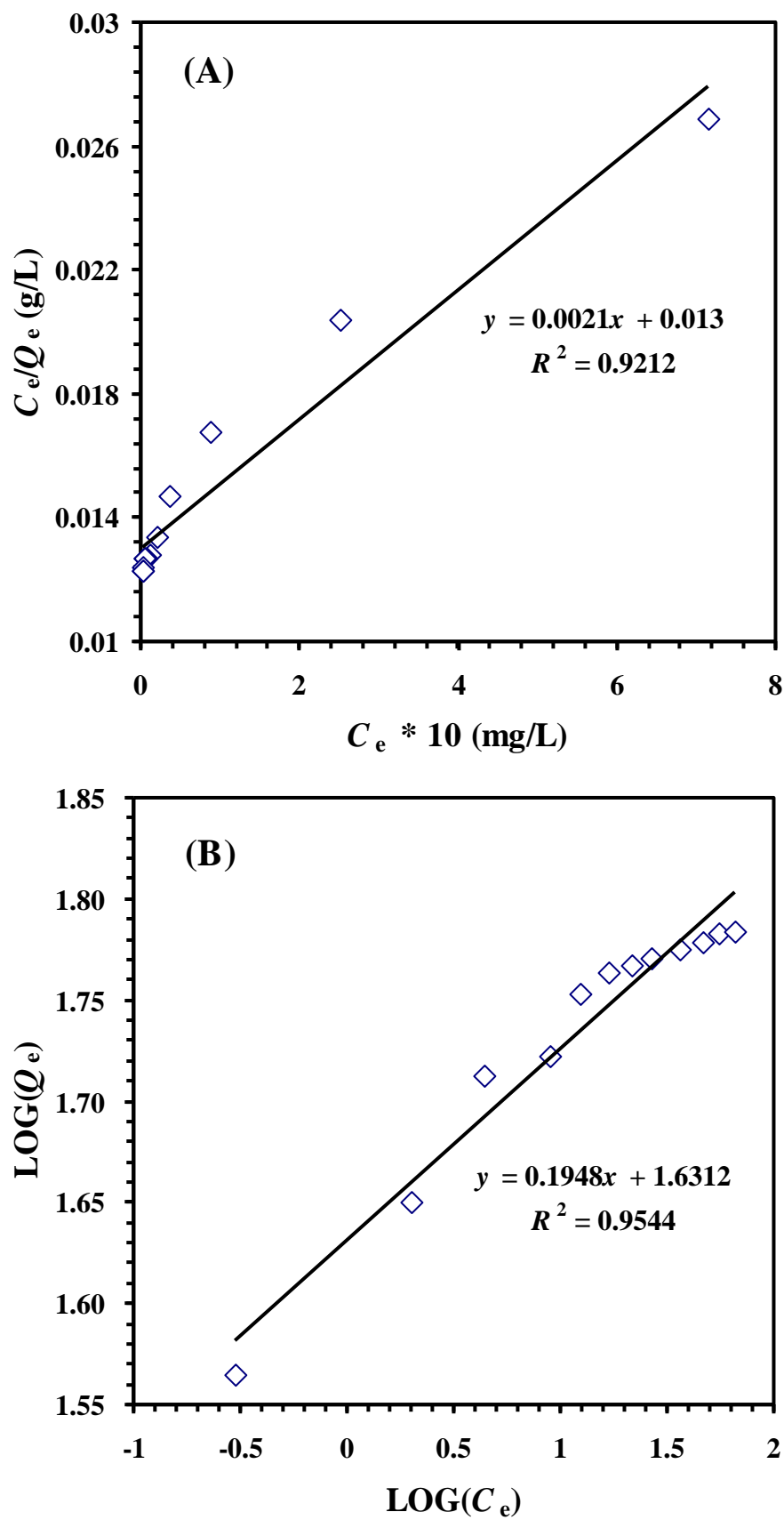**Fig. S5.** Isothermal (a) As(III) and (b) As(V) adsorption profiles of the α-Fe$_2$O$_3$ nanowires/diatomite sample.

(A)

$$y = 0.0021x + 0.013$$
$$R^2 = 0.9212$$

Plot axes: C_e/Q_e (g/L) versus $C_e * 10$ (mg/L)

(B)

$$y = 0.1948x + 1.6312$$
$$R^2 = 0.9544$$

Plot axes: $LOG(Q_e)$ versus $LOG(C_e)$

Fig. S6. The Langmuir and Freundlich regression curves of As(III) adsorption on the α-Fe$_2$O$_3$ nanowires/diatomite sample.
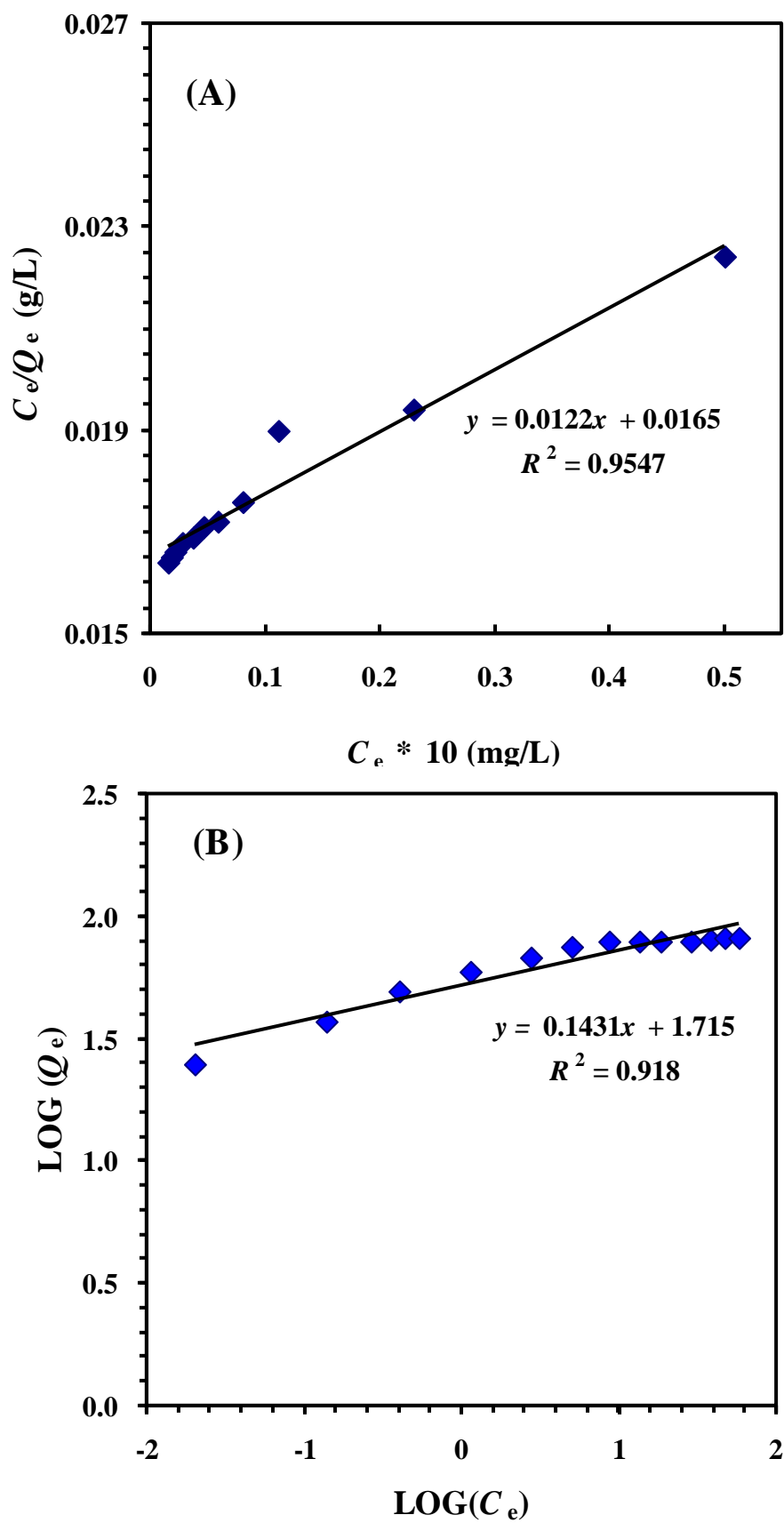
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Fig. S7. The (A) Langmuir and (B) Freundlich regression curves of As(V) adsorption on

the α-Fe$_2$O$_3$ nanowires/diatomite sample.