Supporting Information

Efficient elimination of Cr(VI) in aqueous phase using nano zero-valent iron synthesized with Ginkgo biloba extracts: Enhanced mechanism and reduced toxicity

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Equation S1:

$$\eta = \frac{C_0 - C_t}{C_0} \times 100\%$$

Where C_0 and C_t are the initial concentration of Cr(VI) in the solution and the concentration measured at time t (mg/L) and η represents the removal rate of Cr(VI)

Equation S2:

$$\mathrm{Ln}\frac{C_t}{C_0} = -k_1 t$$

Equation S3:

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{t}{q_e}$$

Equation S4:

$$Q_t = k_3 t^{0.5} + C$$

Equation S5:

$$Q_t = \left(\frac{1}{\beta}\right)\ln(\alpha\beta) + \left(\frac{1}{\beta}\right)\ln(t)$$

Where C_0 and C_t represent the initial concentration of Cr(VI) and the concentration at time t (mg/L), respectively. q_e (mg/g) and q_t (mg/g) are the removal capacities of Cr(VI) at equilibrium and time t, respectively. k_1 (min^{-1}) reflects the rate constant for the pseudo-first order reaction. k_2 (g/mg·min) represents the rate constant of the pseudo-secondary reaction. k_3 ($mg/g \cdot min^{0.5}$). C is the rate constants and the corresponding Y-axis intercepts (q_t-$t^{0.5}$) in the intraparticle diffusion model. α (mg/g·min) and β (mg/g) represent the constants of the Elovich model.

Table

Table S1 Fitting parameters of the four kinetic models for the removal of Cr(VI) using GB-nZVI at different pH conditions

pH	t/min	Pseudo-first-order		Pseudo-second-order		Intra-particle diffusion		Elovich	
		k_1 (min^{-1})	R^2	k_2 ($g \cdot mg^{-1} \cdot min^{-1}$)	R^2	k_3 ($g \cdot mg^{-1} \cdot min^{-1/2}$)	R^2	β($mg \cdot g^{-1}$)	R^2
3	0-3	0.657	0.994	1.010	0.999	2.754	0.751	4.694	0.926
	5-15					0.057	0.819		
	20-30					0.013	0.865		
5	0-3	0.204	0.989	0.200	0.889	1.023	0.999	1.094	0.985
	5-15					0.662	0.898		
	20-30					0.025	0.813		
7	0-3	0.214	0.983	0.210	0.945	0.502	0.999	2.327	0.988
	5-15					0.292	0.989		
	20-30					0.067	0.933		
9	0-3	0.199	0.965	0.198	0.901	0.321	0.992	3.375	0.974
	5-15					0.149	0.618		
	20-30					0.013	0.775		

Figures

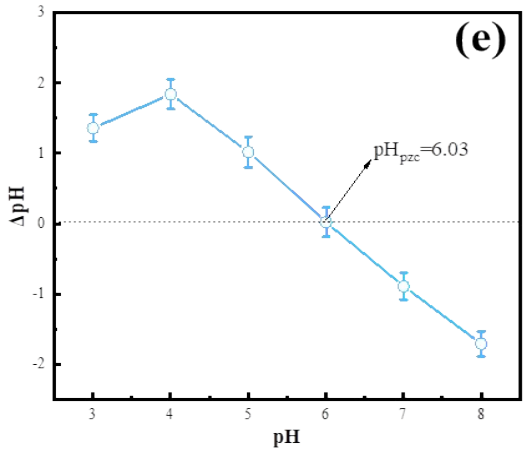

Fig. S1 Removal of Cr(VI) by GB-nZVI, ML-nZVI and HL-nZVI(a, b); Effect of pH (c) and temperature (d) on the removal of Cr(VI); and pHpzc of GB-nZVI (e)

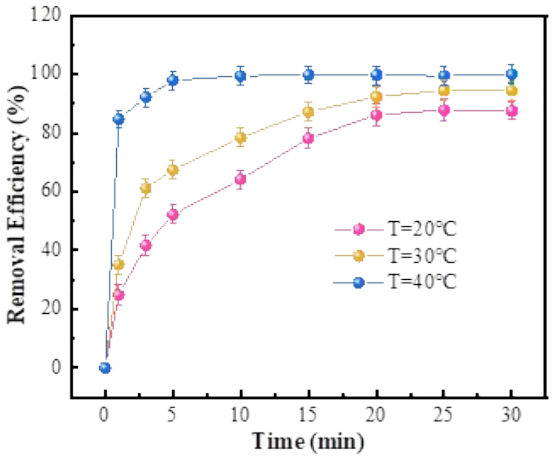

Fig. S2 Effect of temperature on the removal of Cr(VI)