Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Synthesis of magnetic porous γ-Fe_2O_3/C@HKUST-1 composites for efficient removal of dyes and heavy metal ions from aqueous solution

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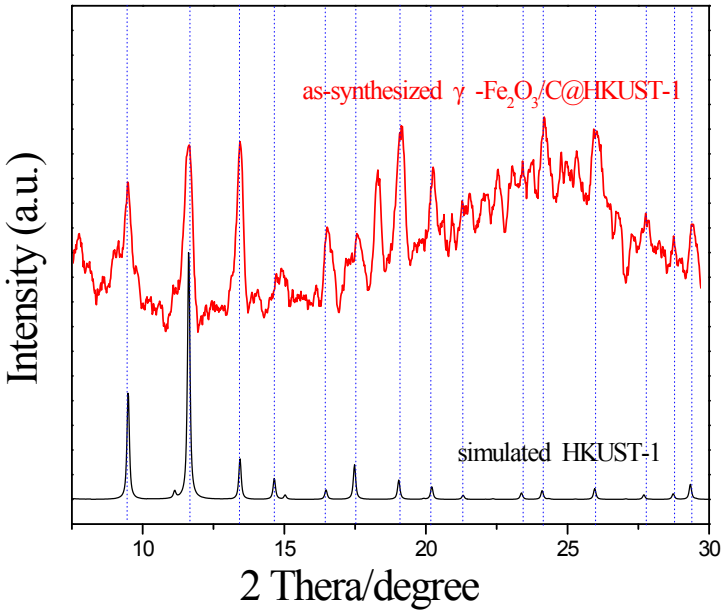

Fig.S1 The XRD local amplification figure (7.5°-30°) of γ -Fe_2O_3/C@HKUST-1.

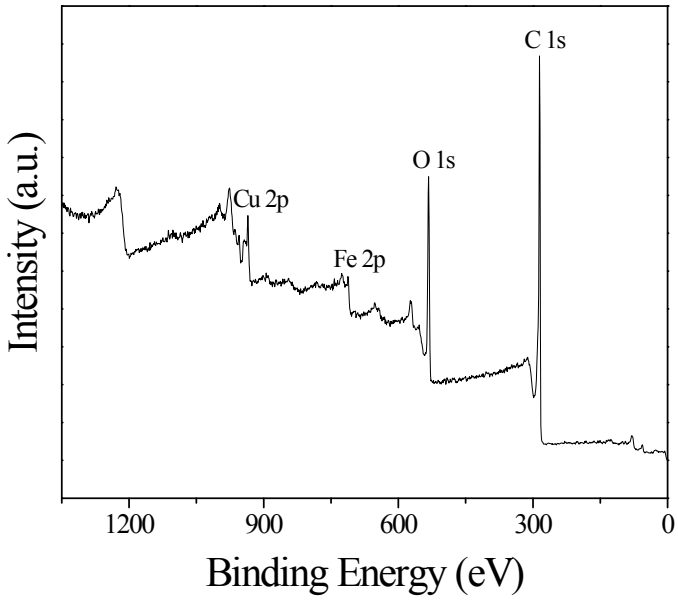

Fig.S2 XPS survey spectrum of the as-prepared γ-Fe2O3/C@HKUST-1.

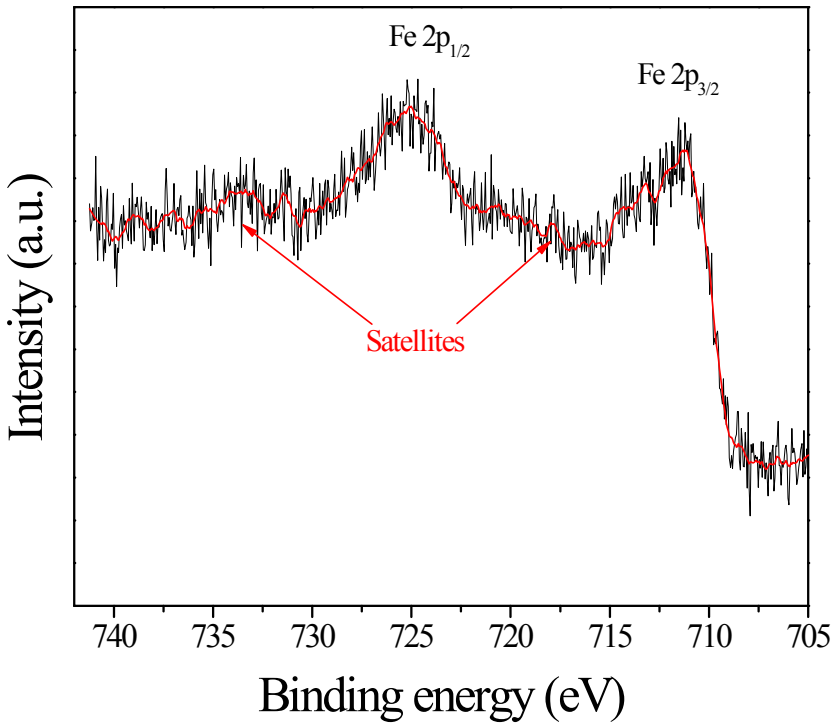

Fig. S3 XPS spectrum of as-prepared γ-Fe_2O_3/C@HKUST-1: high-resolution Fe 2p binding energy spectrum.

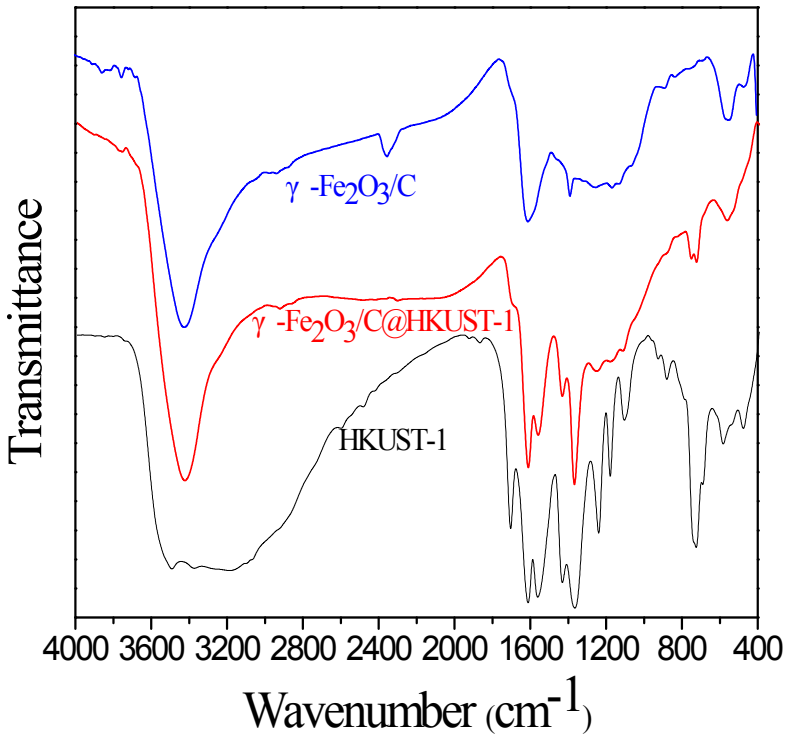

Fig. S4 FT-IR spectrum of γ-Fe_2O_3/C, γ-Fe_2O_3/C@HKUST-1 and HKUST-1

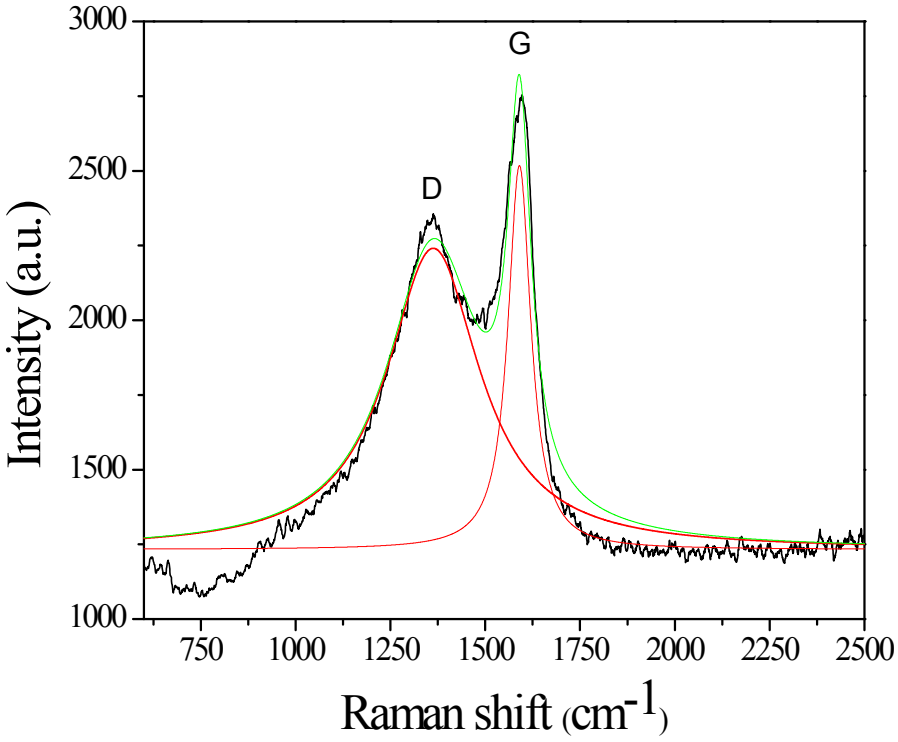

Fig. S5 Raman spectrum of γ-Fe_2O_3/C@HKUST-1 sample (red line: the integral peak, green line: the fitted curve by Guassian type)

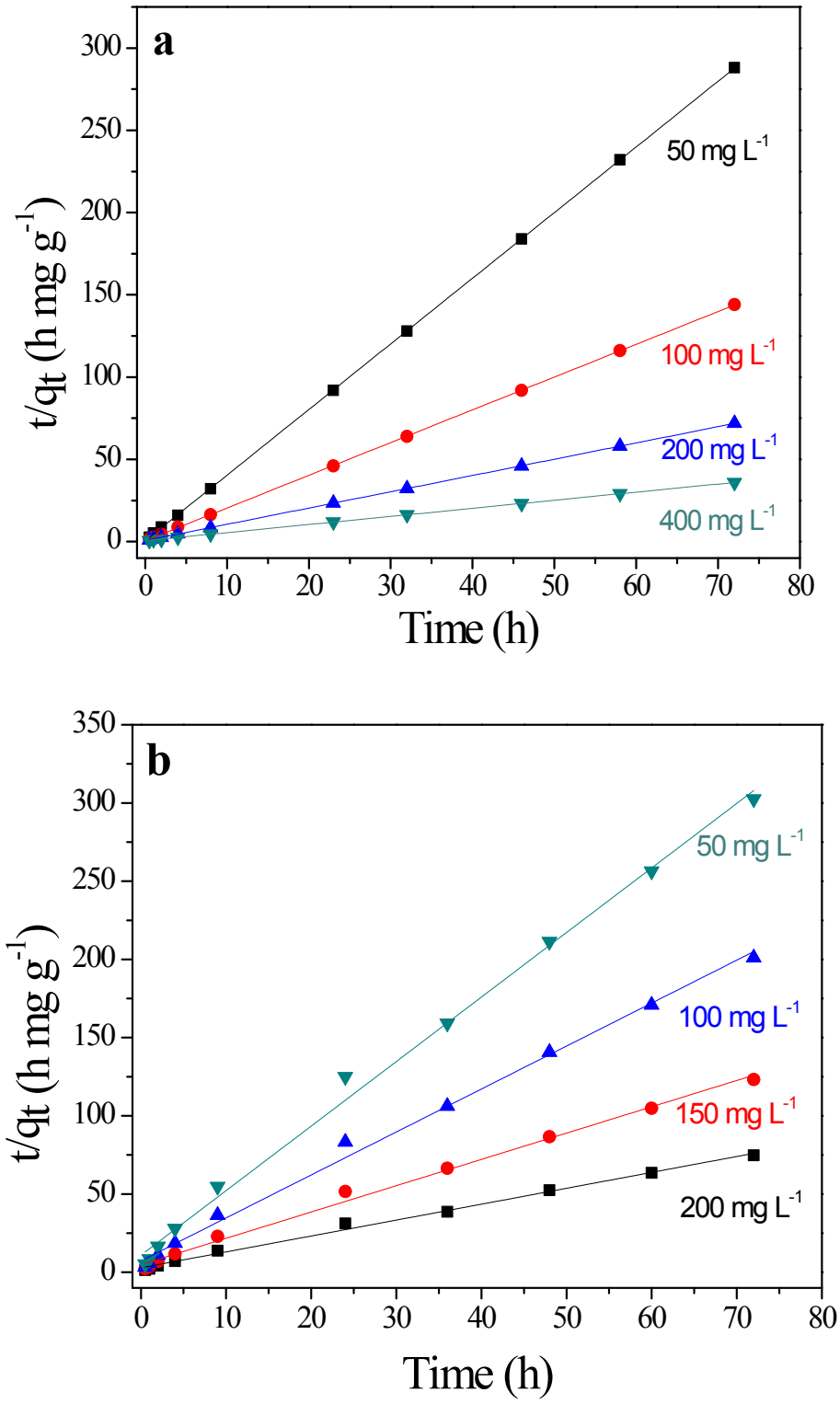

Fig. S6 Plots of pseudo-second-order kinetics for the adsorption of MB (a) and Cr (VI) (b) on γ-Fe_2O_3/C@HKUST-1.

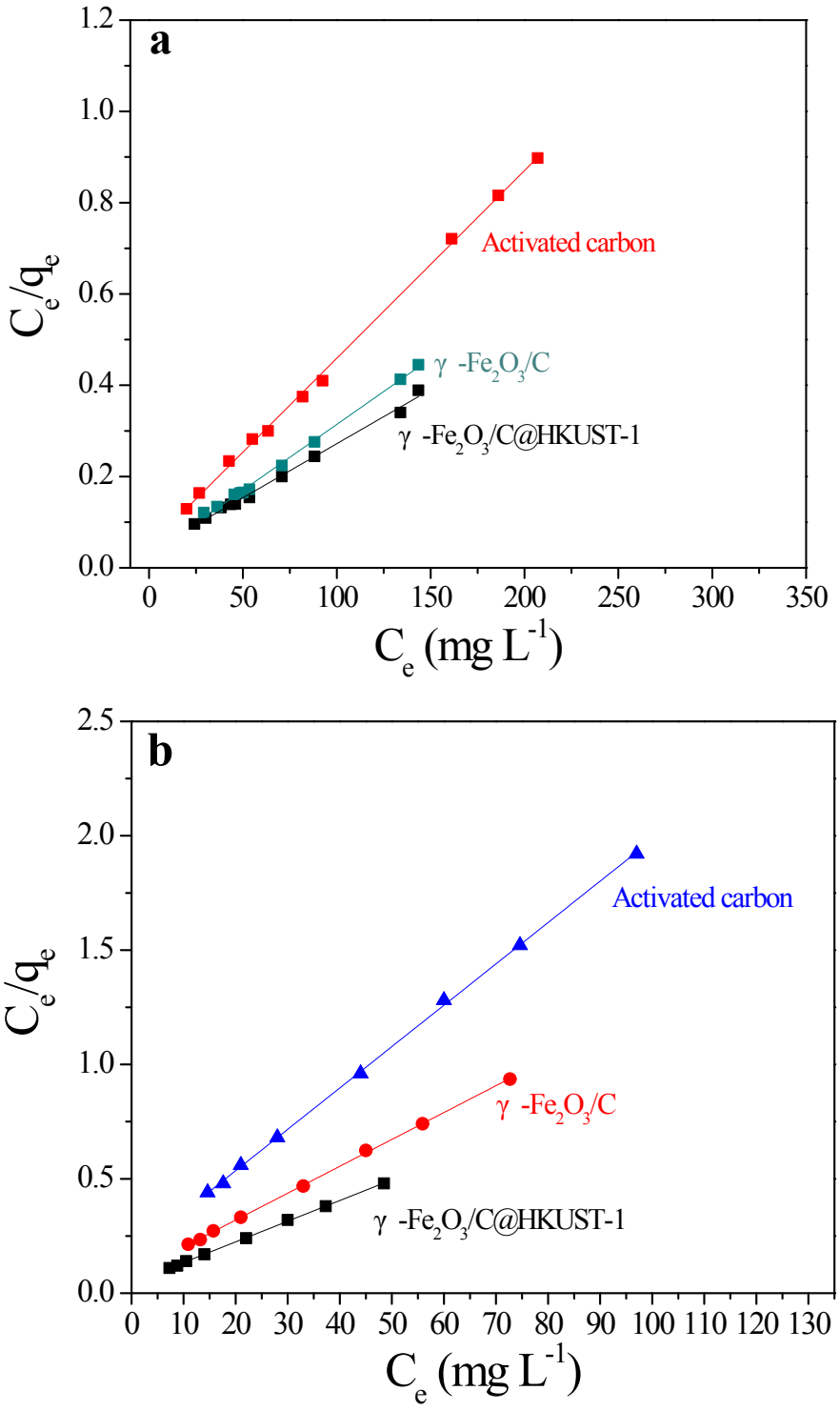

Fig. S7 Langmuir plots of the isotherms for MB (a) and Cr (VI) (b) adsorption onto different adsorbents.

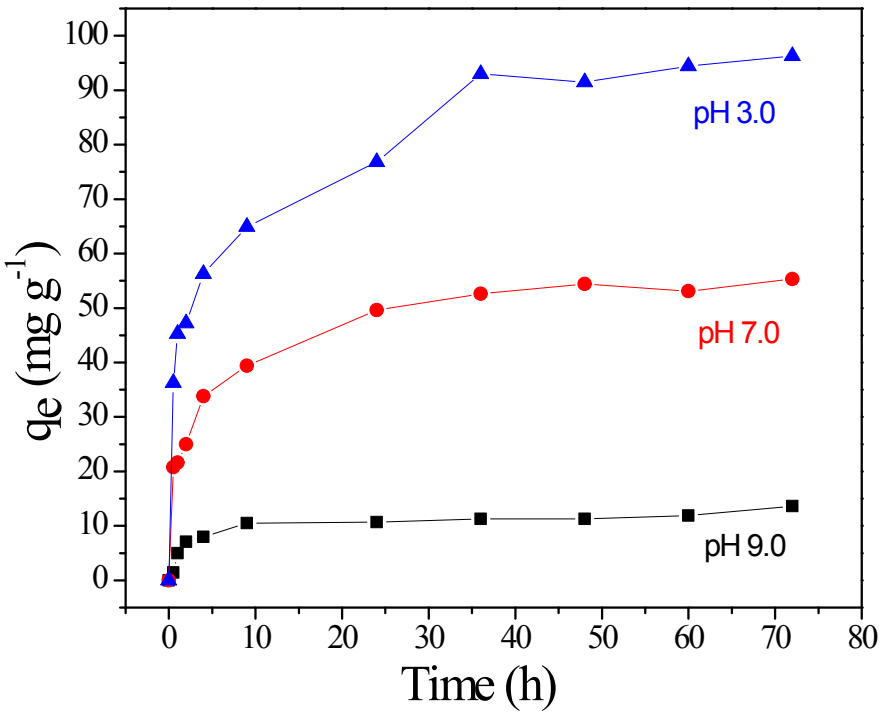

Fig. S8 Influence of pH on the adsorption of Cr (VI)

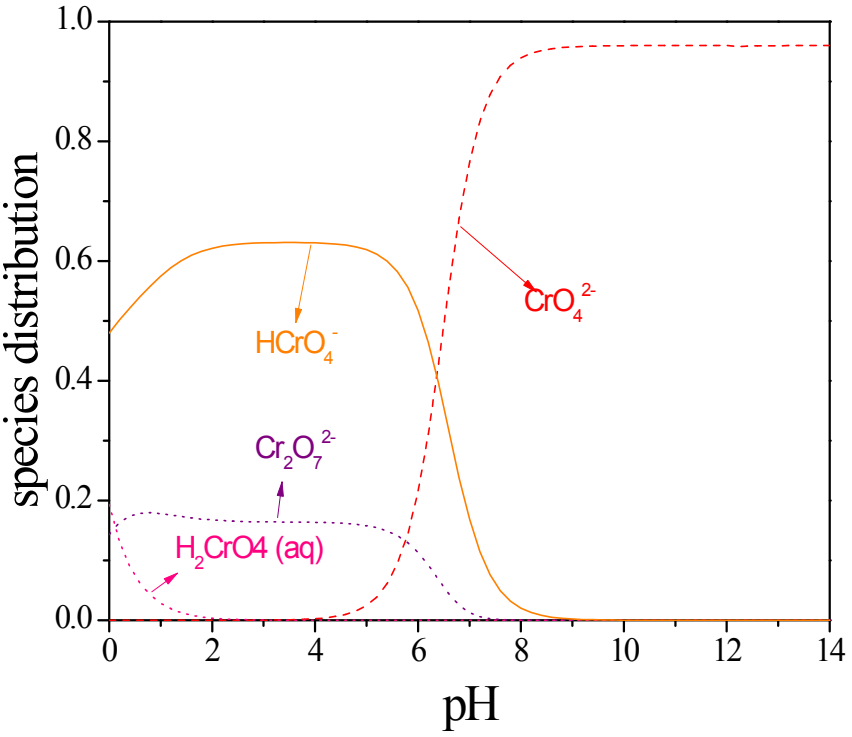

Fig. S9 The species of Cr (VI) (obtained by running Visual MINTEQ 3.0 based on the experimental data) at different pH values of solution.

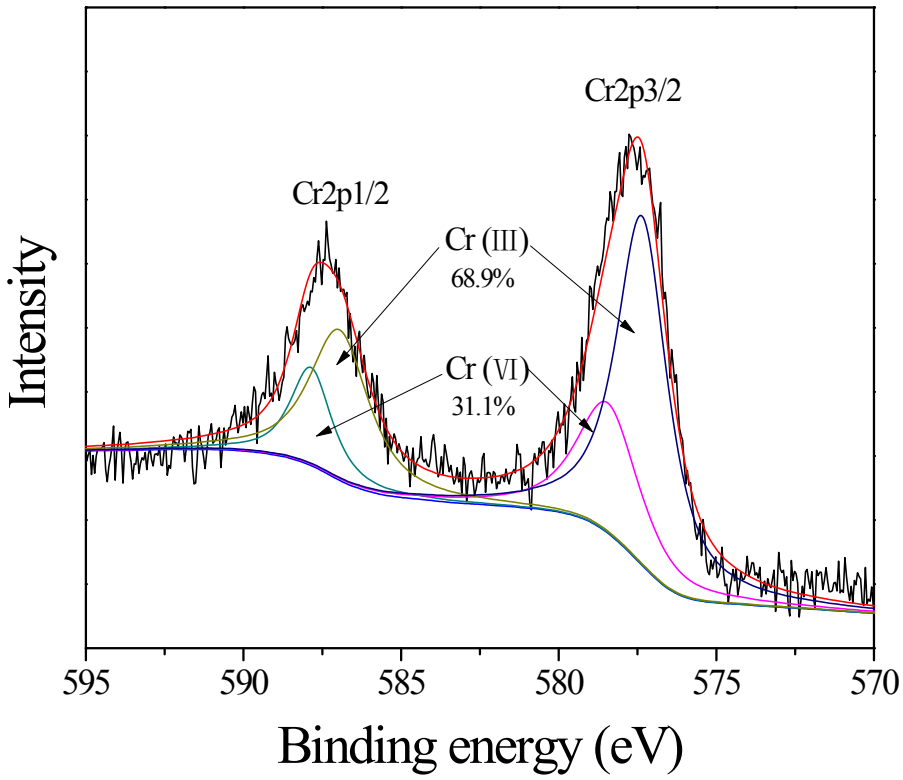

Fig. S10 XPS spectra of Cr 2p on the γ-Fe_2O_3/C@HKUST-1 surface after sorption.

Table S1 Kinetic parameters for the adsorption of MB and Cr (VI) on γ-Fe_2O_3/C@HKUST-1 at 303 K.

Pollutants	C_0/mg L^{-1}	q_e (exp)/mg g^{-1}	Pseudo-second-order kinetic model		
			q_e (cal)/mg g^{-1}	k_2/g mg^{-1} min^{-1}	R^2
MB	400	198.5	204.1	5.80×10^{-3}	0.999
	200	100	101.0	6.35×10^{-3}	0.999
	100	48.6	50.2	5.05×10^{-3}	0.999
	50	23.7	25.1	5.21×10^{-3}	0.999
Cr (VI)	200	96.3	98.1	2.84×10^{-2}	0.995
	150	58.4	59.5	4.88×10^{-2}	0.995
	100	35.8	36.4	7.27×10^{-2}	0.996
	50	23.8	24.2	1.09×10^{-1}	0.996

Notes: C_0, initial concentration of MB or Cr (VI); q_e (cal), calculated adsorption capacity; q_e (exp), experimental adsorption capacity; k_2, pseudo-second-order kinetic constant.

Table S2 Langmuir parameters for the adsorption of MB and Cr (VI) on γ-Fe_2O_3/C@HKUST-1 at 303 K.

Pollutants	q_{exp} / mg g^{-1}	Langmuir constants		
		Q_m	K_L	R^2
MB	370.2	400	0.07	0.999
Cr (VI)	101.4	105	0.32	0.998

Notes: q_{exp}, experimental adsorption capacity; Q_m, calculated adsorption capacity; $K_{L,}$ Langmuir constant.