Support information

Preparation and Application of Magnetic Nanocomposite by Waste Toner for Cr(VI) Removal

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Table S1. Surface area, pore size and pore volume of WT(Air), WT(Vac) and WT (NH_3)

Sample	$S_{BET}(m^2g^{-1})$	Pore size(nm)	Pore volume(cm^3g^{-1})
WT(Air)	11.93	23.30	0.069
WT(Vac)	11.75	12.75	0.037
WT(NH_3)	42.53	9.19	0.098

Table S2 Pseudo-second-order kinetics for Cr(VI) removal by WT(NH_3) and WT(Vac)

sample	Qe(mg g^{-1})	Pseudo-second-order		
		q_e(mg g^{-1})	$k_2(h^{-1})$	R^2
WT(NH_3)-H_2SO_4	12.483	15.38	0.0352	0.9851
WT(NH_3)-HCl	8.9786	9.901	0.1186	0.9967
WT(Vac)-H_2SO_4	3.5714	3.906	0.1959	0.9705
WT(Vac)-HCl	3.7299	4.202	0.1666	0.9765

Table S3 Adsorption isotherms simulation parameters

sample	Langmuir		
	q_e(mg g^{-1})	$K_L(h^{-1})$	R^2
WT(NH_3)-H_2SO_4	25.64	0.039	0.995
WT(NH_3)-HCl	35.84	0.027	0.993

Table S4 Comparison of Cr(VI) removal capacity of various adsorbents.

Adsorbents	pH	Time (min)	S_{BET} (m^2 g^{-1})	q_{max} (mg g^{-1})	ref
Magnetic Biochar	1.0	300	56.2	27.2	1
Magnetic Fe_3O_4 nanoparticles	2.0	30	/	12.43	2
Fe_3O_4 @ SiO_2 nanoparticles	2.0	100	3.78	3.8	3
N-doped carbon with magnetic particles	3.0	30	1136	16	4
Magnetic carbon particles (MCPs)	1.0	10	32.6	15.89	5
Magnetic carbon fibers (MCFs)	1.0	10	124.7	43.18	5
ZVI @ carbon @ polyaniline nanocomposite	1.0	5	18.52	508	6
Chitosan-coated-magnetite with covalently grafted polystyrene based carbon nanocomposites	3.0	40	58	8.0	7
Fluorine and nitrogen co-doped magnetic carbons	1.0	15	82.7	740.7	8
Magnetic waste toner	2.0	420	42.53	35.84	This work

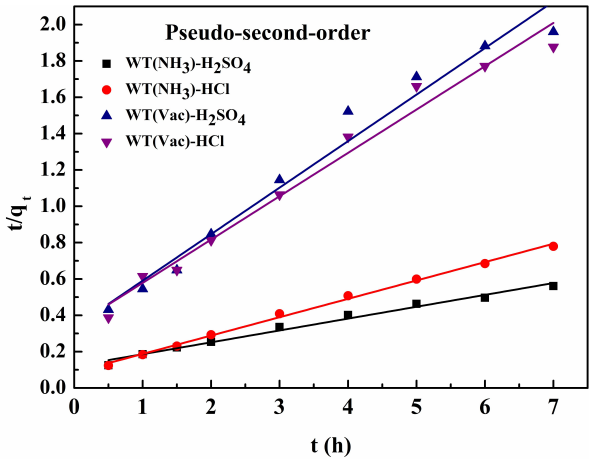

Fig. S1 Kinetics of Cr(VI) adsorption by WT(NH_3) and WT(Vac) in H_2SO_4 and HCl system.

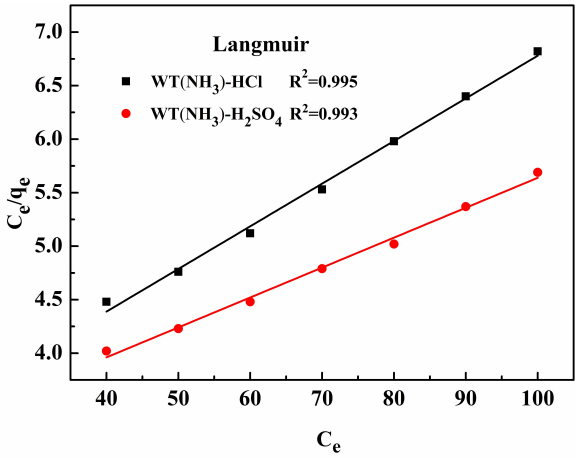

Fig. S2 Linear fitting of adsorption isotherms of WT(NH_3) in H_2SO_4 and HCl system.

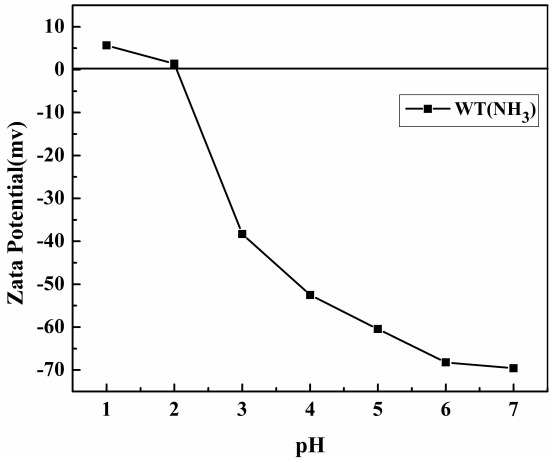

Fig. S3 Effect of pH value on Zeta Potential by WT(NH_3).

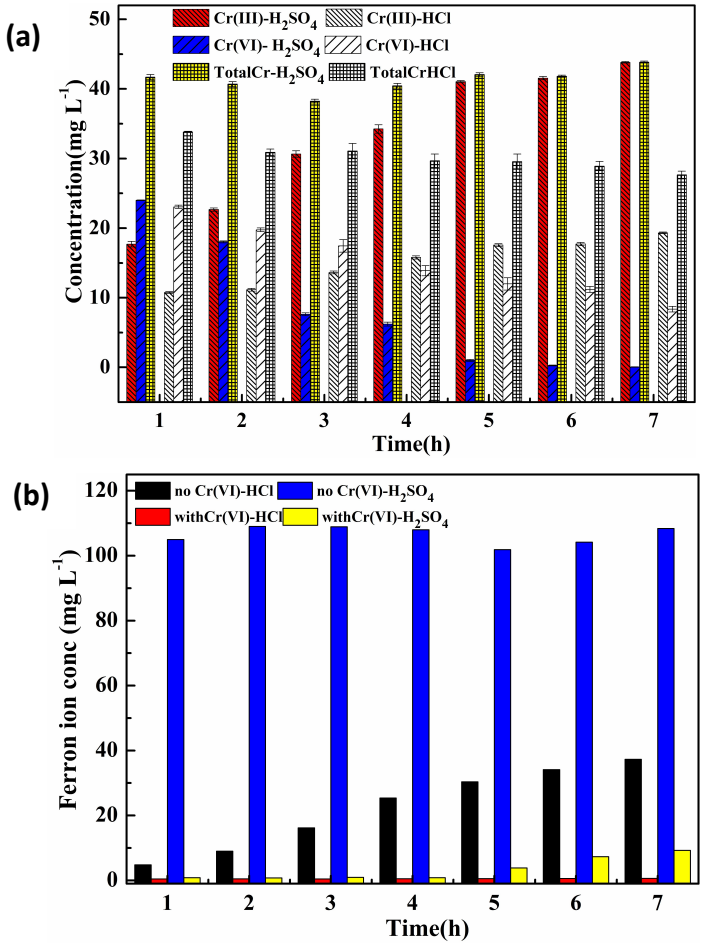

Fig. S4 (a) Concentration of Cr speciation after adsorption by WT(NH_3) in the solution with different acid system. (b) Concentration of ferrous ion in different acid system with no and with Cr(VI).

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