

Supporting Information

Water-soluble carboxymethyl chitosan (WSCC)-modified single-walled carbon nanotubes (SWCNTs) provides an efficient adsorption of Pb (II) from water

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Fig. S1. TEM image of WSCC-oSWCNTs complex.

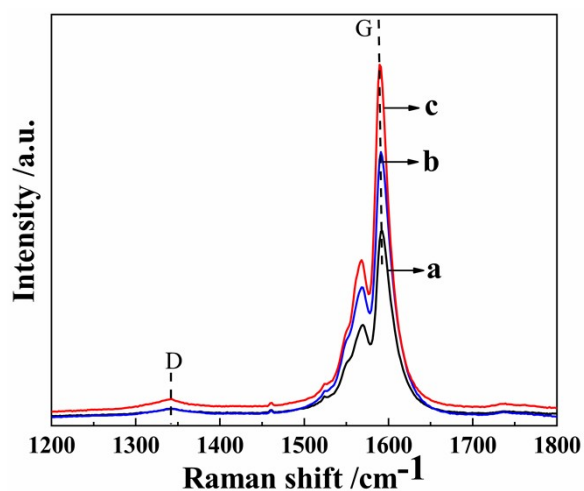


Fig. S2. Raman spectra of (a) SWCNTs, (b) oSWCNTs, and (c) WSCC-oSWCNTs complex.

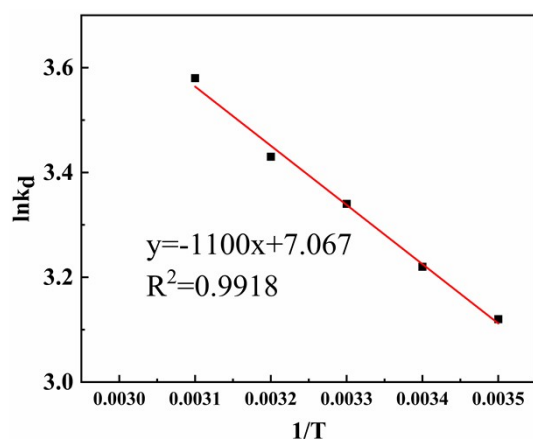


Fig. S3. Linear thermodynamic curve of $\ln k_d$ vs $1/T$ of Pb (II) adsorption using WSCC-oSWCNTs complex.

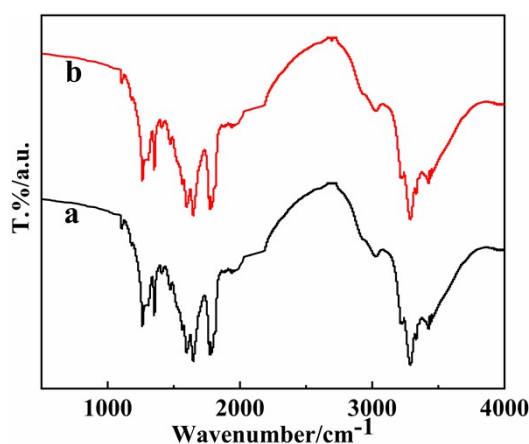


Fig. S4. FT-IR spectra of WSCC-oSWCNTs (a) before and (b) after 4 successive cycles of adsorption/desorption process for Pb (II).

Table S1. Values of kinetic parameters for Pb (II) from water using WSCC-oSWCNTs complex

Kinetic Model	R^2	k_1 (k_2)	q_e (calculated)	q_e (experimental)
Pseudo First Order Kinetics	0.489	0.010	1.430	
Pseudo Second Order Kinetics	0.984	0.011	21.53	21.06

Table S2. Parameter values of adsorption isotherms for Pb (II) from water using WSCC-oSWCNTs complex

Isotherm model	Parameters	Parameter values
Langmuir	R^2	0.9709
	q_m	113.63 mg g ⁻¹
	b	1.702 L mg ⁻¹

Freundlich	R^2	0.9971
	K_F	51.62 mg g ⁻¹ /mg L ⁻¹
	1/n	0.5698
Temkin	R^2	0.8764
	k_1	20.86 J mol ⁻¹
	k_2	12.03 L g ⁻¹
Dubinin–Raduskevich–Kanager	R^2	0.9182
	q_{D-R}	220.7 mg g ⁻¹
	E	1.929 kJ mol ⁻¹

Table S3. Thermodynamic parameters at different temperatures

Temperature (k)	$\Delta G(KJ \cdot mol^{-1})$	$\Delta H(KJ \cdot mol^{-1})$	$\Delta S(KJ \cdot mol^{-1} \cdot K^{-1})$
293	-8.07	9.15	58.76
298	-8.37		
303	-8.66		
308	-8.95		
313	-9.25		

Table S4. The Pb (II) ion adsorption in the presence of diverse competing metal ions by the adsorbent

Ions	Na ⁺	K ⁺	Ca ²⁺	Mg ²⁺	Cd ²⁺	Hg ²⁺	Al ³⁺	Cr ³⁺
Efficiency/ %	4.52	5.68	6.37	8.86	10.47	12.56	5.31	4.69