Supporting Information

β-Cyclodextrins Stabilized Magnetic Fe_3S_4 Nanoparticles for Efficient Removal of Pb (II)

Long Kong,[a] Lili Yan,[b] Zan Qu,[a] Naiqiang Yan,[a] and Liang Li [a*]

[a]School of Environmental Science and Engineering, Shanghai Jiao Tong University, Shanghai 200240, China. E-mail: liangli117@sjtu.edu.cn; Tel: +86 21 54747567

[b]School of Agriculture and Biology, Shanghai Jiao Tong University, Shanghai 200240, China.

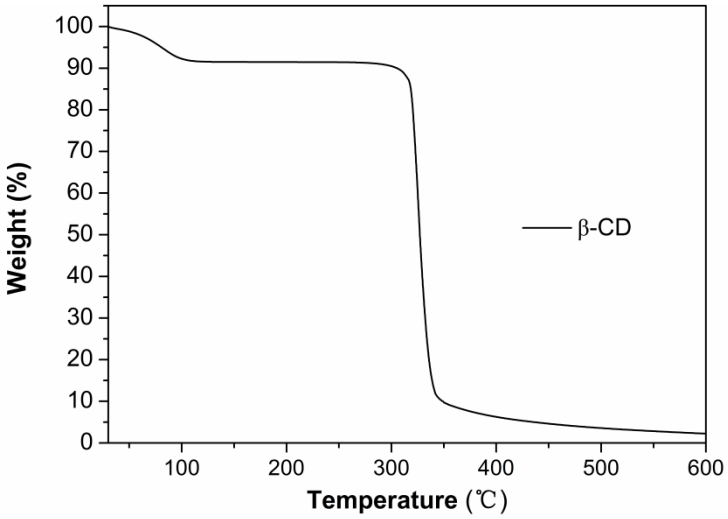

Fig S1 TGA curve of β-CD

The TGA result of β-CD was shown in Figure S1. Under the temperature range of 30-600 ℃，the β-CD was almost completely decomposed with a residual weight about 2%. And the surface β-CD of CD-Fe_3S_4 could also be decomposed. Based on the TGA analysis data of Fig 4 and Fig S1, the weight percentage of β-CD in CD_1-Fe_3S_4 and CD_2-Fe_3S_4 could be estimated. Thus, the β-CD was calculated to be 3.69% and 6.85% for CD_1-Fe_3S_4 and CD_2-Fe_3S_4, respectively.

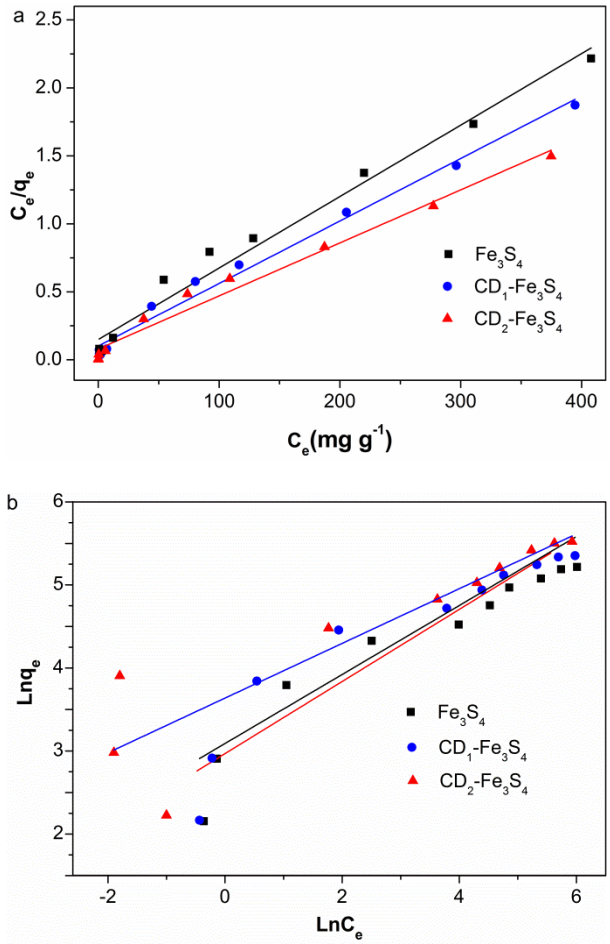

Figure S2. The fittings of Langmuir model (a) and Freundlich model (b) for the adsorption of Pb (II) by Fe_3S_4, CD_1-Fe_3S_4 and CD_2-Fe_3S_4. The symbols are experimental data; the solid lines represent the fitted curves.

Table S1 Adsorption isotherm parameters for Langmuir and Freundlich model of Pb (II) adsorption by Fe_3S_4, CD_1-Fe_3S_4 and CD_2-Fe_3S_4.

Adsorbent	Langmuir model			Freundlich model		
	Q_m (mg g^{-1})	K_L (L mg^{-1})	R^2	K_F (mg g^{-1})	n	R^2
Fe_3S_4	190.11	0.035	0.979	18.31	2.43	0.912
CD_1-Fe_3S_4	217.39	0.045	0.987	21.93	2.41	0.874
CD_2-Fe_3S_4	256.41	0.049	0.979	38.00	3.04	0.807

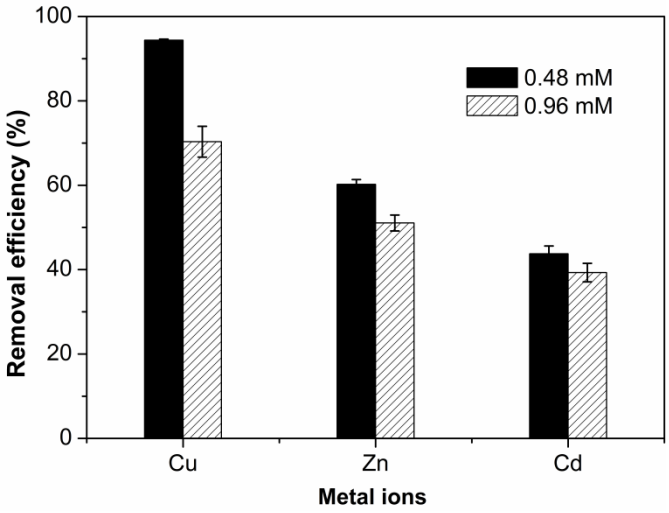

Fig S3 Removal efficiency of Cu (II), Zn (II), and Cd (II) by CD_2-Fe_3S_4. Experiment conditions: Metal ions concentration (0.48, 0.96 mM), Pb (II) concentration 100 mg L^{-1}(50 mL), sorbent 35 mg, pH 6.0, contact time 24 h, temperature 25 ℃.

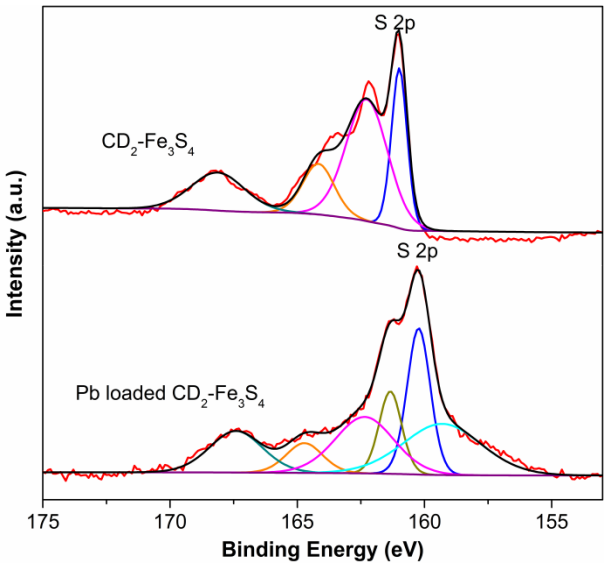

Fig S4 XPS spectra of S 2p regions for CD_2-Fe_3S_4 before and after Pb (II) adsorption.