Supporting Information

Removal of fluoride from Phosphogypsum leaching solution with phosphate tailing based layered double hydroxides: Kinetics and Equilibrium Isotherms

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Table S1. Fitting parameters by pseudo-first-order, pseudo-second-order models and intra-particle diffusion model for the Adsorption equilibrium time of PTB-LDO3 and PTB-LDO4.

		Pseudo-first-order kinetic model			Pseudo-second-order kinetic model			Intra-particle diffusion		
Absorbent	q_e (mg g^{-1})	k_1 (min^{-1})	q_{e1} (mg g^{-1})	R^2	$k_2(\times10^{-4})$ (g mg^{-1} min^{-1})	q_{e2} (mg g^{-1})	R^2	K_p (mg g^{-1} $min^{-0.5}$)	C (mg g^{-1})	R^2
PTB-LDO3	10.58	0.03181	10.31	0.9757	30.01	12.15	0.9941	-24.76	11.71	0.9074
PTB-LDO4	8.68	0.02856	8.47	0.9837	30.69	10.16	0.9967	-21.54	9.63	0.9232

Table S2. Parameters fitted by Langmuir, Freundlich, D-R and Temkin models for F^- by PTB-LDO3 and PTB-LDO4.

	Langmuir model			Freundlich model		
T(K)/Absorbent	b	q_m	R^2	n	K_f	R^2
298/PTB-LDO3	0.152	26.03	0.9960	0.5499	4.3835	0.9962
308/PTB-LDO3	0.1501	17.02	0.9992	0.5180	3.0151	0.9812
318/PTB-LDO3	0.1456	11.33	0.9892	0.5060	2.0116	0.9885
298/PTB-LDO4	0.1724	15.66	0.9872	0.4758	3.2094	0.9803
308/PTB-LDO4	0.1638	11.44	0.9947	0.4722	2.2823	0.9484
318/PTB-LDO4	0.1467	8.50	0.9893	0.4930	1.5550	0.9442

	D-R model				Temkin model		
T(K)/Absorbent	$k_D \times 10^6$	q_m	E	R^2	A_T	b_T	R^2
298/PTB-LDO3	1.3054	16.43	0.6189	0.9292	1.8700	475.24	0.9807
308/PTB-LDO3	1.6694	11.31	0.5473	0.9381	1.6540	714.22	0.9885
318/PTB-LDO3	1.6916	7.58	0.5437	0.9608	1.2580	1000.101	0.9915
298/PTB-LDO4	1.6540	11.03	0.5498	0.9165	2.1256	779.41	0.9708
308/PTB-LDO4	1.2635	7.75	0.6290	0.9279	1.5417	1002.09	0.9959
318/PTB-LDO4	1.7313	5.75	0.5374	0.9421	1.2991	1348.48	0.9914