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MDPI

Supplementary Material

Adsorption kinetics and isotherm

Table S1. Kinetic parameters for the Zn(II) adsorption onto Mg-HPA adsorbent.

Pseudo-First-Order Constants			
Initial Zn(II) Concentration (mg/L)	**K_1(g/(mg·min))**	**q_e(mg/g)**	**R^2**
10	0.2832	1.3274	0.8729
20	1.3503	3.8586	0.8695
50	1.7492	5.7500	0.8688
Morrist particle intimal diffusion constants			
Initial Zn(II) concentration (mg/L)	K_1(g/(mg·min$^{1/2}$))	C	R^2
10	0.0328	13.807	0.6803
20	0.0953	17.027	0.7976
50	0.2357	23.888	0.7883
Elovich constants			
Initial Zn(II) concentration (mg/L)	α	β	R^2
10	0.2348	13.165	0.9249
20	0.6561	15.292	0.9769
50	1.3631	20.677	0.9783

Table S2. Isotherm parameters for the Zn(II) adsorption onto Mg-HPA adsorbent.

Freundlich Constants			
Temperature(°C)	**K_F(L/mg)**	***1/n***	**R^2**
25	24.181	0.2147	0.7024
35	26.495	0.2199	0.7528
45	27.404	0.2374	0.8476

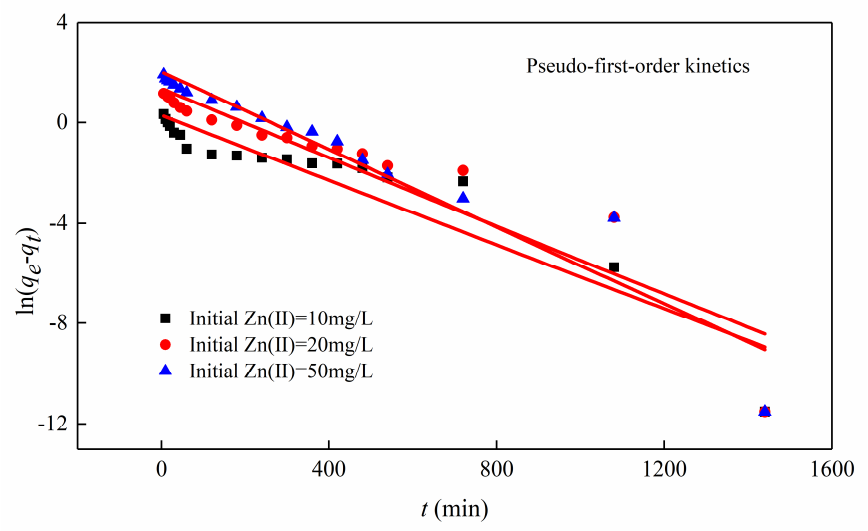


Figure S1. Pseudo-first-order kinetics for Zn(II) adsorption onto the Mg-HAP adsorbent (initial pH=6; initial concentration 10,20, and 50 mg/L; adsorbent dose 0.25 g/50 mL; 25 °C).

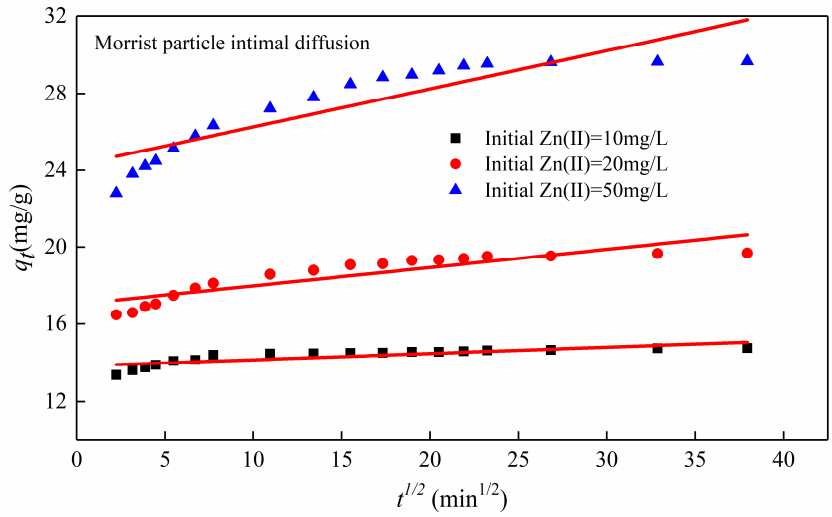


Figure S2. Morrist particle intimal diffusion model for Zn(II) adsorption onto the Mg-HAP adsorbent (initial pH=6; initial concentration 10,20, and 50 mg/L; adsorbent dose 0.25 g/50 mL; 25 °C).

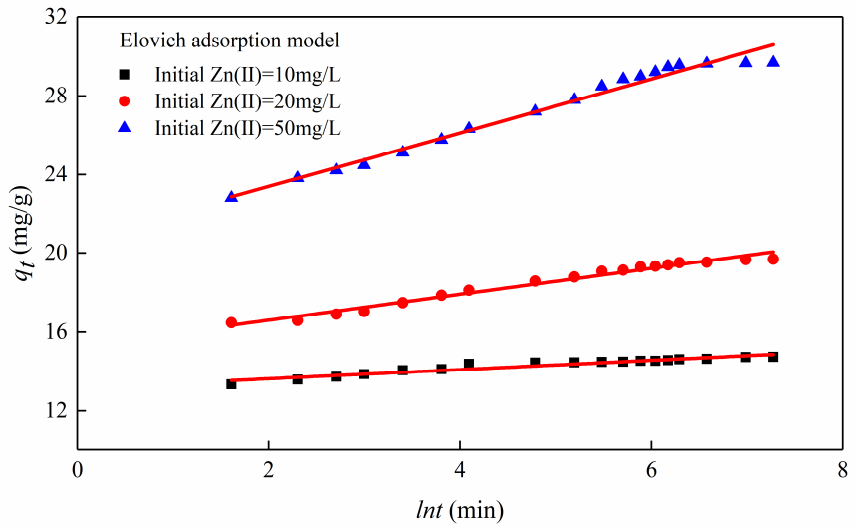


Figure S3. Elovich adsorption model for Zn(II) adsorption onto the Mg-HAP adsorbent (initial pH=6; initial concentration 10,20, and 50 mg/L; adsorbent dose 0.25 g/50 mL; 25 °C).

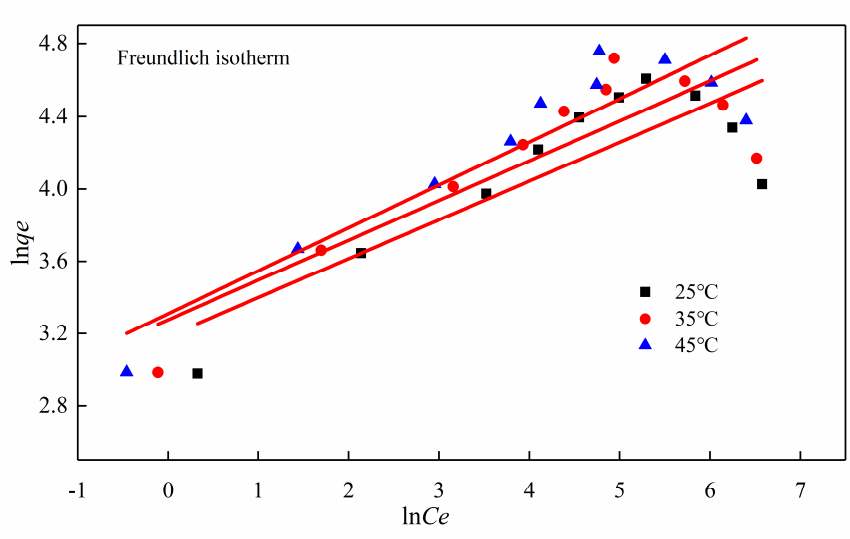


Figure S4. Freundlich isotherm for Zn(II) adsorption onto the Mg-HAP at 25℃,35℃ and 45℃(initial pH=6; initial concentration 10,20, and 50 mg/L; adsorbent dose 0.25 g/50 mL).

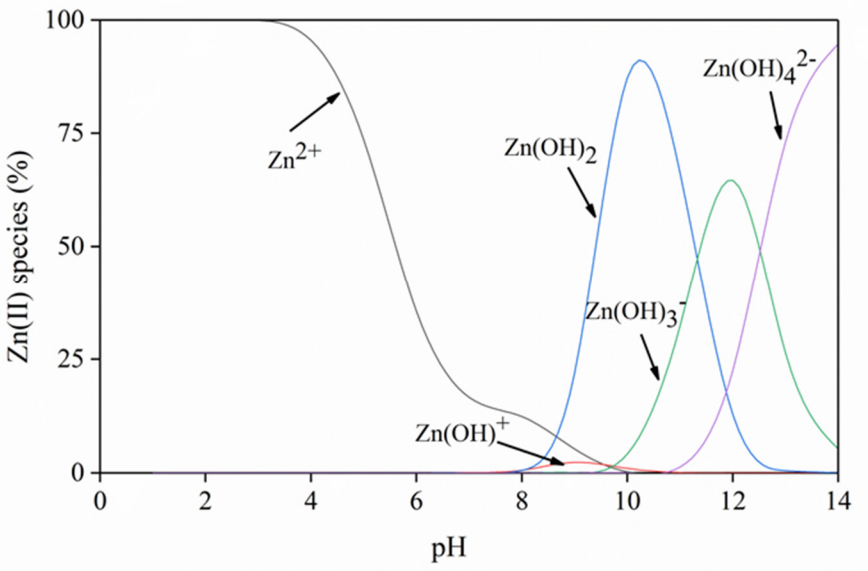


Figure S5. Various forms of zinc in aqueous liquor.