

Appendix

A.1 Experimental values of concentrations

Experimental data of the initial concentrations and the equilibrium concentrations for adsorbent Fe(III)-coordinated amino-functionalized mesoporous MCM-41 with four different amino loads for phosphate removal from solution, that were carried out by series of batch experiments, are given in Table A.1.

0%		10%		20%		30%	
C_0 (mg/L)	C_e (mg/L)	C_0 (mg/L)	C_e (mg/L)	C_0 (mg/L)	C_e (mg/L)	C_0 (mg/L)	C_e (mg/L)
0.5005	0.49	0.526	0.061	0.086	0.037	0.527	0.052
0.975	0.78	0.978	0.023	0.973	0.013	0.987	0.017
4.625	3.67	4.63	0.35	4.666	0.036	4.664	0.034
10.97	9.03	11.04	2.45	9.895	0.15	9.815	0.33
26.39	23.98	26.3	16.43	26.85	5.74	26.595	4.12
55.755	53.25	54.855	44.4	51.69	29.54	52.16	26.09

Table A.1: Experimental values of the initial concentrations and the equilibrium concentrations for different amino loads

A.2 Adsorption capacities

The Tables A.2, A.3, A.4 and A.5 contain observed values of the adsorption capacities and predicted values of the adsorption capacities for each data set. According to these data, a data analysis was performed.

0%		
Experiment	Langmuir model	Freundlich model
$Q_{e, \text{experiment}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)
0.021	0.419	0.907
0.39	0.640	1.088
1.91	2.148	1.997
3.88	3.452	2.842
4.82	4.660	4.169
5.01	5.273	5.700

Table A.2: Values of the adsorption capacities for amino loading 0%

10%		
Experiment	Langmuir model	Freundlich model
$Q_{e, \text{experiment}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)
0.93	2.144	5.269
1.91	0.864	4.229
8.56	8.268	7.814
17.18	17.122	12.118
19.74	20.172	18.614
20.91	20.578	23.292

Table A.3: Values of the adsorption capacities for amino loading 10%

20%		
Experiment	Langmuir model	Freundlich model
$Q_{e, \text{experiment}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)
0.098	6.267	9.555
1.92	2.424	7.389
9.26	6.121	9.491
19.49	17.752	13.480
42.22	42.713	33.020
44.3	44.052	49.394

Table A.4: Values of the adsorption capacities for amino loading 20%

30%		
Experiment	Langmuir model	Freundlich model
$Q_{e, \text{experiment}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)	$Q_{e, \text{model}}$ (mg/g)
0.95	4.298	10.058
1.94	1.487	7.362
9.26	2.892	8.933
18.97	18.968	16.843
44.95	45.966	34.067
52.14	51.322	57.016

Table A.5: Values of the adsorption capacities for amino loading 30%