

# Low cost Activated Carbon for the Reduction of NOM and DBPs: Optimization and Comparison

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**Table S1.** Experimental results for the optimization of adsorption capacity considering time, dose, and pH in terms of actual levels.

Std	Time A	Dose B	pH C	R1: DOC Removal	R2: qe (mg/g)
1	5.26	0.14	5.20	46.76	17.25
2	19.23	0.14	5.20	49.48	18.26
3	5.26	0.40	5.20	61.86	7.88
4	19.23	0.40	5.20	76.87	9.80
5	5.26	0.14	8.80	29.42	10.86
6	19.23	0.14	8.80	39.87	14.59
7	5.26	0.40	8.80	42.11	5.37
8	19.23	0.40	8.80	45.37	5.78
9	0.50	0.27	7.00	53.78	10.19
10	24.00	0.27	7.00	76.93	14.55
11	12.25	0.05	7.00	28.69	32.05
12	12.25	0.50	7.00	61.42	6.40
13	12.25	0.27	4.00	57.89	10.97
14	12.25	0.27	10.00	26.30	4.98
15	12.25	0.27	7.00	58.93	11.16
16	12.25	0.27	7.00	57.58	10.91
17	12.25	0.27	7.00	55.99	10.61

<sup>1</sup> Std: standard run number, R: response, a:1.68, qe: adsorption capacity (mg/g).

**Table S2.** ANOVA for quadratic model of DOC removal.

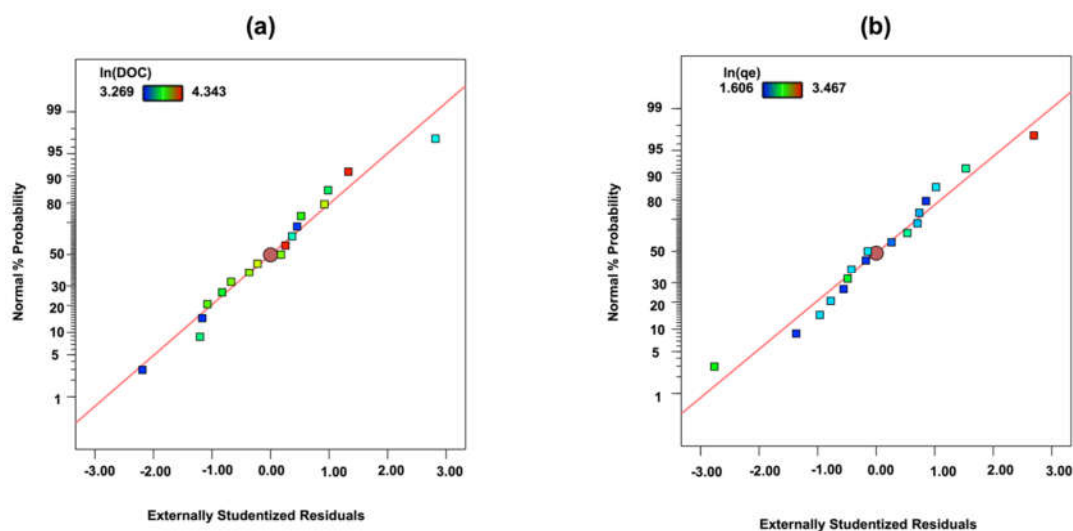
Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	1.59	9	0.1763	27.00	0.0001	significant
A-Time	0.1147	1	0.1147	17.57	0.0041	significant
B-Dose	0.4537	1	0.4537	69.48	< 0.0001	significant
C-pH	0.6238	1	0.6238	95.53	< 0.0001	significant
AB	0.0006	1	0.0006	0.0882	0.7751	
AC	0.0013	1	0.0013	0.2064	0.6634	
BC	0.0068	1	0.0068	1.04	0.3411	
A <sup>2</sup>	0.0199	1	0.0199	3.05	0.1243	
B <sup>2</sup>	0.1327	1	0.1327	20.33	0.0028	significant
C <sup>2</sup>	0.2036	1	0.2036	31.18	0.0008	significant
Residual	0.0457	7	0.0065			

df: degree of freedom.

**Table S3.** ANOVA for quadratic model of qe.

Source	Sum of Squares	df	Mean Square	F-value	p-value	
Model	3.64	9	0.4048	40.00	< 0.0001	significant
A-Time	0.1132	1	0.1132	11.18	0.0123	significant
B-Dose	2.42	1	2.42	238.66	< 0.0001	significant
C-pH	0.6274	1	0.6274	61.98	0.0001	significant
AB	0.0004	1	0.0004	0.0438	0.8403	
AC	0.0011	1	0.0011	0.1126	0.7471	
BC	0.0063	1	0.0063	0.6257	0.4549	
A <sup>2</sup>	0.0074	1	0.0074	0.7294	0.4213	
B <sup>2</sup>	0.0777	1	0.0777	7.68	0.0276	significant
C <sup>2</sup>	0.2564	1	0.2564	25.33	0.0015	significant
Residual	0.0709	7	0.0101			

df: degree of freedom



**Figure S1.** Plots of normal probability of residuals (a) DOC removal, (b) adsorption capacity ( $q_e$ ).

**Table S4.** Modeling results for equilibrium isotherms of natural and synthesized water sample.

Model	Adsorbent	Water Sample	Parameters		R <sup>2</sup>
Freundlich	1.00% Al-AC	Natural	$K_f = 25.75,$	$n = 1.78$	0.95
	1.00% Al-AC	Synthesized	$K_f = 4.39,$	$n = 1.33$	0.94
	0.75% Fe-AC	Natural	$K_f = 16.56,$	$n = 1.54$	0.97
	0.75% Fe-AC	Synthesized	$K_f = 4.51,$	$n = 1.51$	0.87
	AC-A10	Natural	$K_f = 20.54,$	$n = 1.90$	0.93
	AC-A10	Synthesized	$K_f = N/A,$	$n = N/A$	0.63
Temkin	1.00% Al-AC	Natural	$B = 25.01$		0.95
	1.00% Al-AC	Synthesized	$B = 11.95$		0.93
	0.75% Fe-AC	Natural	$B = 26.71$		0.99
	0.75% Fe-AC	Synthesized	$B = 9.47$		0.85
	AC-A10	Natural	$B = 20.54$		0.98
	AC-A10	Synthesized	$B = N/A$		0.52