

# Supplementary Materials:

## Removal of Model Aromatic Hydrocarbons from Aqueous Media with a Ferric Sulfate–Lime Softening Coagulant System

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### *Box-Behnken Experimental Design*

Experimental design contains 3 factors with 2 replicates with a base runs of 15 and 30 total runs, including 6 center points for each system (PNP and naphthalene).

**Table S1.** Box-Behnken experimental design for the removal of pollutants.

Run	PNP			Naphthalene		
	Ferric sulfate (mg/L)	Lime (%) <sup>*</sup>	Initial conc.	Ferric sulfate (mg/L)	Lime (%) <sup>*</sup>	Initial conc.
1	10	50	18	30	50	13
2	100	50	18	100	50	13
3	10	200	18	30	200	13
4	100	200	18	100	200	13
5	10	125	1	30	125	1
6	100	125	1	100	125	1
7	10	125	35	30	125	25
8	100	125	35	100	125	25
9	55	50	1	65	50	1
10	55	200	1	65	200	1
11	55	125	35	65	125	25
12	55	125	35	65	125	25
13	55	125	18	65	125	13
14	55	125	18	65	125	13
15	55	125	18	65	125	13

<sup>\*</sup> The lime dosage is based on a percent concentration relative to that for ferric sulfate.

## ANOVA

Model summary showed statistical parameters that include  $R^2$  value= 93.1%;  $R^2$  (adj) = 91.0% and  $R^2$  (pred) = 89.1% for PNP data analysis.

Table S2. Analysis of variance for PNP

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	9	1441.09	160.121	33.61	0.000
Linear	3	995.12	331.707	69.64	0.000
PNP	1	928.20	928.200	194.86	0.000
Fe (III)	1	22.33	22.335	4.69	0.043
Lime	1	44.59	44.585	9.36	0.006
Square	3	475.39	158.462	33.27	0.000
PNP*PNP	1	51.05	51.046	10.72	0.004
Fe (III)*Fe (III)	1	22.51	22.508	4.73	0.042
Lime*Lime	1	385.04	385.037	80.83	0.000
2-Way Interaction	3	2.38	0.795	0.17	0.917
PNP*Fe (III)	1	0.50	0.500	0.10	0.749
PNP*Lime	1	0.60	0.605	0.13	0.725
Fe (III)*Lime	1	1.28	1.280	0.27	0.610
Error	8	95.27	4.763		
Lack-of-Fit	5	95.26	31.752	25.38	0.0562
Pure Error	3	0.01	0.001		
Total	17	1536.35			

Model summary showed statistical parameters that include  $R^2$  value= 96.6%;  $R^2$  (adj) = 95.0% and  $R^2$  (pred) = 93.4% for naphthalene data analysis.

**Table S3.** Analysis of variance for naphthalene

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Model	9	1192.29	132.477	62.53	0.000
Linear	3	516.12	172.042	81.20	0.000
NAPHTHALENE	1	495.06	495.062	233.66	0.000
Fe (III)	1	5.06	5.063	2.39	0.138
LIME	1	16.00	16.000	7.55	0.012
Square	3	666.92	222.306	104.92	0.000
NAPHTHALENE*NAPHTHALENE	1	666.46	666.462	314.55	0.000
Fe (III)*Fe (III)	1	1.85	1.846	0.87	0.362
LIME*LIME	1	2.88	2.885	1.36	0.257
2-Way Interaction	3	9.25	3.083	1.46	0.257
NAPHTHALENE*Fe (III)	1	8.00	8.000	3.78	0.066
NAPHTHALENE*LIME	1	0.12	0.125	0.06	0.811
Fe (III)*LIME	1	1.13	1.125	0.53	0.475
Error	7	42.38	2.119		
Lack-of-Fit	3	32.38	10.792	18.35	0.0703
Pure Error	4	10.00	0.588		
Total	16	1234.67			