

Table S1

BBD, Observed, Predicted and Residual Values for Three-Level-Three-Factor Response Surface Analysis.

Run	X_1 (v/v)	X_2 (wt. %)	X_3 (min)	Observed acid value (mg KOH/g)	Predicted acid value (mg KOH/g)	Residual
1	2.50 (1)	6 (1)	15 (0)	2.03	1.89	1.41
2	1.50 (-1)	4 (0)	10 (-1)	4.17	4.22	-0.05
3	2.50 (1)	4 (0)	20 (1)	2.82	2.78	0.04
4	2.00 (0)	4 (0)	15 (0)	2.37	2.48	-0.11
5	2.00 (0)	4 (0)	15 (0)	2.71	2.48	0.23
6	1.50 (-1)	2 (-1)	15 (0)	4.06	4.20	-0.14
7	2.00 (0)	4 (0)	15 (0)	2.48	2.48	0.00
8	2.00 (0)	2 (-1)	20 (1)	2.93	3.03	-0.10
9	2.50 (1)	2 (-1)	15 (0)	3.38	3.32	0.06
10	2.00 (0)	4 (0)	15 (0)	2.59	2.48	0.11
11	2.00 (0)	4 (0)	15 (0)	2.26	2.48	-0.22
12	1.50 (-1)	4 (0)	20 (1)	3.05	2.81	0.24
13	1.50 (-1)	6 (1)	15 (0)	2.48	2.54	-0.06
14	2.00 (0)	6 (1)	20 (1)	1.69	1.88	-0.19
15	2.00 (0)	2 (-1)	10 (-1)	4.29	4.10	0.19
16	2.00 (0)	6 (1)	10 (-1)	2.26	2.16	0.10
17	2.50 (1)	4 (0)	10 (-1)	2.48	2.72	-0.24

X_1 – methanol:oil ratio, X_2 – ferric sulfate, X_3 – time

Table S2

CCD, Observed, Predicted and Residual Values for Five-Level-Three-Factor Response Surface Analysis.

Run	X_1 (v/v)	X_2 (w/v)	X_3 (min)	Observed NSOME (wt. %)	Predicted NSOME (wt. %)	Residual
1	0.65 (0)	0.65 (0)	50 (- α)	98.00	96.74	1.26
2	0.65 (0)	2.75 (0)	50 (0)	98.70	97.85	0.85
3	0.40 (-1)	4.00 (1)	65 (1)	89.60	89.77	-0.17
4	0.90 (1)	1.50 (-1)	65 (1)	98.50	98.53	-0.03
5	0.23 (- α)	2.75 (0)	50 (0)	95.40	93.97	1.43
6	0.65 (0)	4.85 (α)	50 (0)	88.30	88.30	0.00
7	0.65 (0)	2.75 (0)	50 (0)	98.30	97.85	0.45
8	0.90 (1)	4.00 (1)	35 (-1)	91.00	89.24	1.76
9	0.40 (-1)	4.00 (1)	35 (-1)	95.30	96.16	-0.86
10	0.65 (0)	2.75 (0)	75.23 (α)	94.30	92.17	2.13
11	0.65 (0)	2.75 (0)	50 (0)	96.80	97.85	-1.05
12	0.90 (1)	4.00 (1)	65 (1)	87.10	88.55	-1.45
13	0.65 (0)	2.75 (0)	24.77 (- α)	96.00	96.87	-0.87
14	0.90 (1)	1.50 (-1)	35 (-1)	97.00	97.72	-0.72
15	1.07 (α)	2.75 (0)	50 (0)	94.00	94.17	-0.17
16	0.40 (-1)	1.50 (-1)	35 (-1)	96.80	96.24	0.56
17	0.65 (0)	2.75 (0)	50 (0)	97.00	97.85	-0.85
18	0.65 (0)	2.75 (0)	50 (0)	97.70	97.85	-0.15
19	0.40 (-1)	1.50 (-1)	65 (1)	88.70	91.35	-2.65
20	0.65 (0)	2.75 (0)	50 (0)	98.40	97.85	0.55

X_1 – methanol:oil ratio, X_2 -CCPHA, X_3 – time, α denotes the axial point with a coded level of 1.682