

Supplementary Information

Table S1.

The parameters for transesterification of *Linum usitatissimum* oil and the yield of biodiesel obtained through the use of RSM and ANN methods.

Std Order	Reaction parameter				Yield (%)		
	Molar Ratio	Catalyst Concentration (%)	Temperature (°C)	Time (min)	Experimental	RSM	ANN
28	7.5	0.75	45	90	67.4	66.8	67.4
29	7.5	0.75	45	55	77.9	77.4	77.9
30	7.5	0.75	45	55	77.8	77.4	77.9
24	7.5	1.25	45	55	75.2	75.6	77.5
22	12	0.75	45	55	81.3	81.3	79.6
25	7.5	0.75	25	55	86.8	86.8	86.2
23	7.5	0.25	45	55	75.2	75.0	78.0
21	3	0.75	45	55	70.0	70.3	70.1
26	7.5	0.75	65	55	87.5	87.7	88.0
27	7.5	0.75	45	20	70.5	71.4	70.6
19	7.5	0.75	45	55	77.3	77.9	77.4
17	7.5	0.75	45	55	77.4	77.9	78.9
18	7.5	0.75	45	55	78.2	77.9	78.9
6	9.75	0.50	55	37.5	78.9	78.4	78.9
8	9.75	1.00	55	37.5	83.3	83.8	81.1
7	5.25	1.00	55	37.5	77.3	76.8	74.8
2	9.75	0.50	35	37.5	82.8	83.0	73.1
12	9.75	1.00	35	72.5	74.8	75.5	82.5
4	9.75	1.00	35	37.5	82.1	81.2	81.5
1	5.25	0.50	35	37.5	77.4	77.5	72.9
14	9.75	0.50	55	72.5	77.6	78.1	77.6
16	9.75	1.00	55	72.5	82.0	81.4	82.1
10	9.75	0.50	35	72.5	79.2	79.3	74.5
20	7.5	0.75	45	55	78.0	77.9	79.4
15	5.25	1.00	55	72.5	75.9	75.9	74.4
9	5.25	0.50	35	72.5	75.5	75.2	70.3
3	5.25	1.00	35	37.5	75.0	74.7	78.1
11	5.25	1.00	35	72.5	70.3	70.4	76.5
13	5.25	0.50	55	72.5	73.1	73.6	71.9
5	5.25	0.50	55	37.5	73.1	72.5	76.1

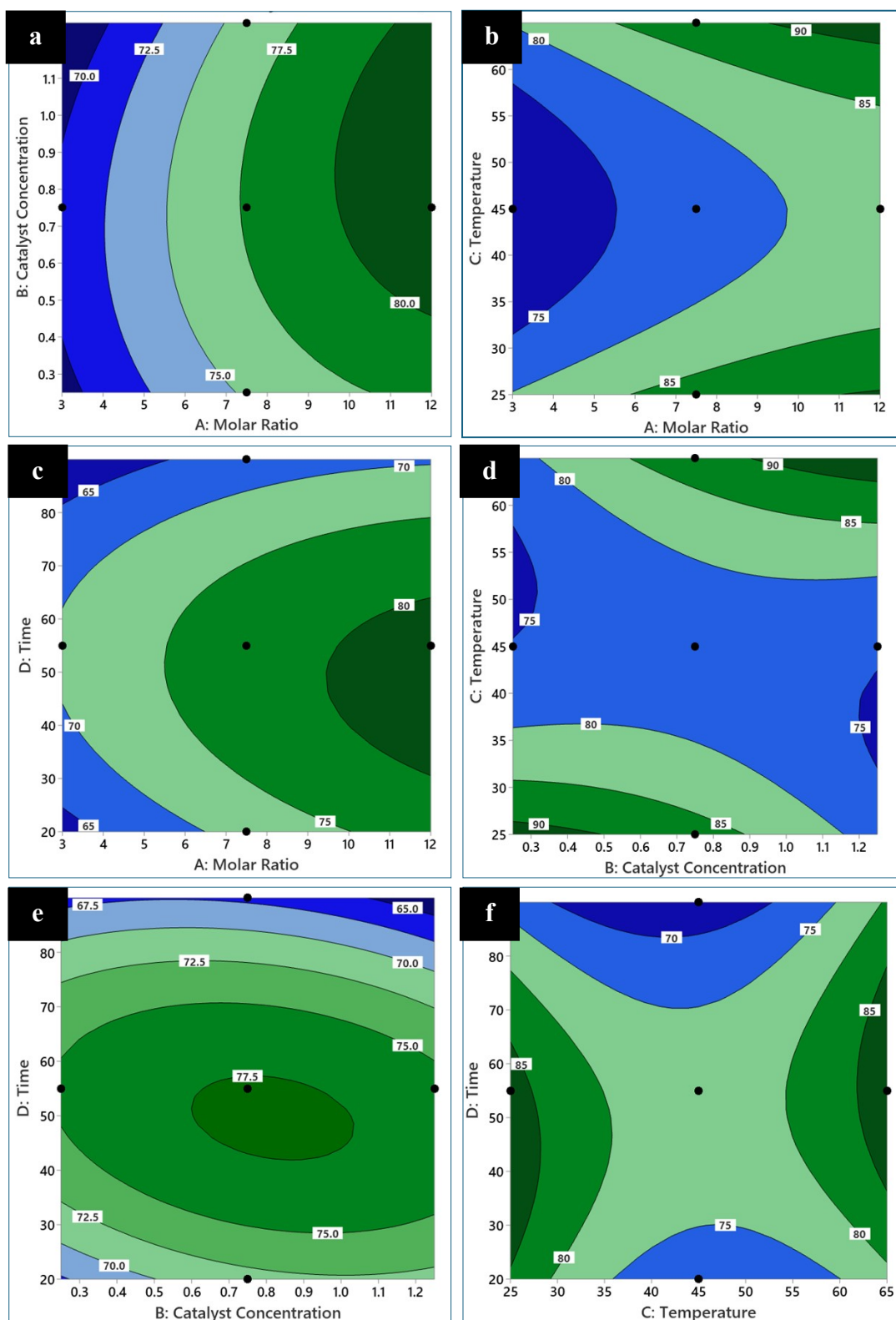


Fig. S1 Contour plot of (a) A*B - interaction between molar ratio*catalyst concentration, (b) A*C - molar ratio*temperature, (c) A*D - molar ratio*time, (d) B*C - catalyst concentration*temperature, (e) B*D - catalyst concentration*time, (f) C*D - temperature*time.

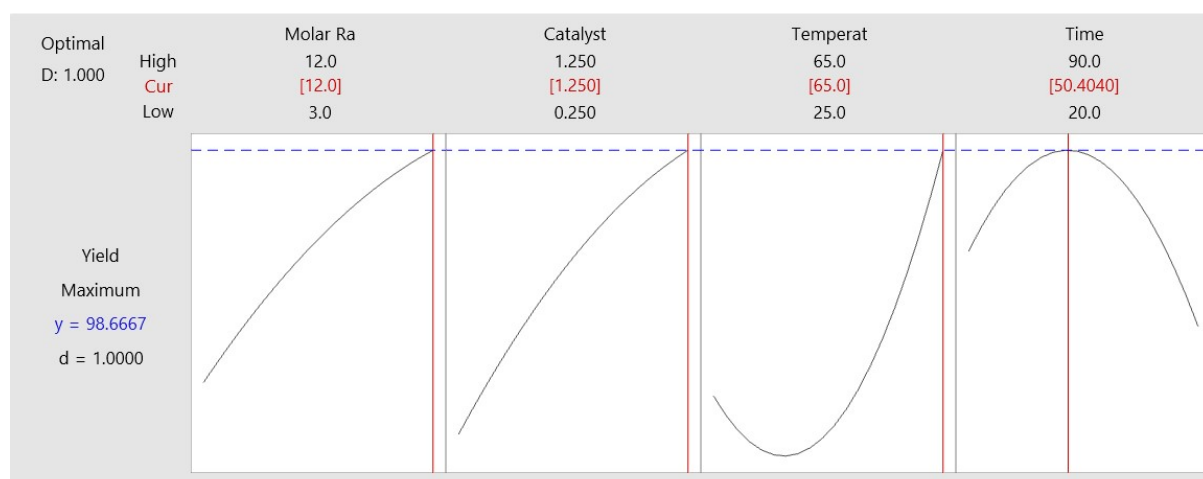


Fig. S2 Reaction parameter determination using RSM optimizer for validation test.