

Use your mouse to right click on individual cells for definitions.

Response: FDR

ANOVA for Response Surface Quadratic Model

Analysis of variance table [Partial sum of squares]

Source	Sum of Squares	DF	Mean Square	F Value	Prob > F	
Model	1605.80	5	321.16	5.50	0.0006	significant
A	260.04	1	260.04	4.46	0.0412	
B	930.02	1	930.02	15.94	0.0003	
A ²	65.21	1	65.21	1.12	0.2969	
B ²	312.62	1	312.62	5.36	0.0260	
AB	3.43	1	3.43	0.059	0.8096	
Residual	2275.33	39	58.34			
Lack of Fit	2274.25	38	59.85	55.39	0.1062	not significant
Pure Error	1.08	1	1.08			
Cor Total	3881.14	44				

The Model F-value of 5.50 implies the model is significant. There is only a 0.06% chance that a "Model F-Value" this large could occur due to noise.

Values of "Prob > F" less than 0.0500 indicate model terms are significant.

In this case A, B, B² are significant model terms.

Values greater than 0.1000 indicate the model terms are not significant.

If there are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

The "Lack of Fit F-value" of 55.39 implies the Lack of Fit is not significant relative to the pure error. There is a 10.62% chance that a "Lack of Fit F-value" this large could occur due to noise. Non-significant lack of fit is good -- we want the model to fit.

Std. Dev.	7.64	R-Squared	0.4137
Mean	15.49	Adj R-Squared	0.3386
C.V.	49.32	Pred R-Square	0.2328
PRESS	2977.74	Adeq Precisor	8.349

The "Pred R-Squared" of 0.2328 is in reasonable agreement with the "Adj R-Squared" of 0.3386.

"Adeq Precision" measures the signal to noise ratio. A ratio greater than 4 is desirable. Your ratio of 8.349 indicates an adequate signal. This model can be used to navigate the design space.

Factor	Coefficient Estimate	DF	Standard Error	95% CI Low	95% CI High	VIF
Intercept	16.91	1	2.20	12.46	21.36	
A-Concentration	-3.42	1	1.62	-6.70	-0.14	1.01
B-Time	7.05	1	1.76	3.48	10.61	1.00

A ²	2.89	1	2.73	-2.64	8.41	1.01
B ²	-7.22	1	3.12	-13.54	-0.91	1.00
AB	-0.61	1	2.50	-5.66	4.45	1.00

Final Equation in Terms of Coded Factors:

$$\begin{aligned} \text{FDR} = & \\ & +16.91 \\ & -3.42 * A \\ & +7.05 * B \\ & +2.89 * A^2 \\ & -7.22 * B^2 \\ & -0.61 * A * B \end{aligned}$$

Final Equation in Terms of Actual Factors:

$$\begin{aligned} \text{FDR} = & \\ & +8.34388 \\ & -21.47957 * \text{Concentration} \\ & +0.18417 * \text{Time} \\ & +18.04399 * \text{Concentration}^2 \\ & -5.01698\text{E-}004 * \text{Time}^2 \\ & -0.012620 * \text{Concentration} * \text{Time} \end{aligned}$$

Diagnostics Case Statistics

Standard	Actual	Predicted			Student	Cook's	Outlier
Order	Value	Value	Residual	Leverage	Residual	Distance	t
1	26.15	24.68	1.47	0.120	0.205	0.001	0.203
2	21.47	20.86	0.61	0.115	0.086	0.000	0.084
3	0.000	8.34	-8.34	0.307 #	-1.313	0.127	-1.325
4	30.47	24.89	5.58	0.189	0.811	0.026	0.807
5	23.69	17.59	6.10	0.129	0.856	0.018	0.853
6	26.53	23.65	2.88	0.315 #	0.456	0.016	0.451
7	8.28	13.42	-5.14	0.179	-0.742	0.020	-0.738
8	19.49	23.22	-3.73	0.115	-0.519	0.006	-0.514
9	0.000	4.77	-4.77	0.180	-0.690	0.017	-0.685
10	20.66	25.24	-4.58	0.137	-0.645	0.011	-0.640
11	18.95	9.77	9.18	0.089	1.260	0.026	1.269
12	23.00	13.86	9.14	0.064	1.236	0.017	1.245
13	34.37	17.05	17.32	0.064	2.344	0.063	2.496
14	30.27	19.34	10.93	0.068	1.482	0.027	1.506
15	24.87	20.73	4.14	0.066	0.561	0.004	0.556

**Run
Order**

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16	20.17	21.21	-1.04	0.065	-0.141	0.000	-0.139
17	9.62	20.79	-11.17	0.090	-1.533	0.039	-1.561
18	3.72	19.47	-15.75	0.180	-2.276	0.189	-2.413
19	0.000	2.64	-2.64	0.164	-0.378	0.005	-0.374
20	11.36	7.56	3.80	0.088	0.521	0.004	0.516
21	13.63	11.58	2.05	0.072	0.279	0.001	0.275
22	10.93	16.91	-5.98	0.083	-0.817	0.010	-0.814
23	12.22	18.22	-6.00	0.078	-0.818	0.009	-0.814
24	15.91	18.63	-2.72	0.072	-0.369	0.002	-0.365
25	20.75	18.13	2.62	0.088	0.359	0.002	0.355
26	30.21	16.73	13.48	0.165	1.931	0.122	2.004
27	0.000	1.95	-1.95	0.176	-0.282	0.003	-0.278
28	8.03	6.80	1.23	0.091	0.169	0.000	0.167
29	9.02	10.74	-1.72	0.069	-0.234	0.001	-0.231
30	13.52	13.78	-0.26	0.071	-0.036	0.000	-0.035
31	14.37	15.92	-1.55	0.073	-0.211	0.001	-0.208
32	14.89	17.15	-2.26	0.069	-0.307	0.001	-0.303
33	18.93	17.48	1.45	0.067	0.196	0.000	0.194
34	19.59	16.91	2.68	0.089	0.367	0.002	0.363
35	23.79	15.44	8.35	0.177	1.205	0.052	1.213
36	0.000	2.71	-2.71	0.326 #	-0.432	0.015	-0.427
37	16.06	11.35	4.71	0.162	0.674	0.015	0.669
38	15.50	7.48	8.02	0.208	1.180	0.061	1.186
39	20.00	20.86	-0.86	0.115	-0.119	0.000	-0.117
40	17.44	16.37	1.07	0.143	0.151	0.001	0.149
41	11.52	17.53	-6.01	0.142	-0.849	0.020	-0.846
42	12.14	17.79	-5.65	0.151	-0.802	0.019	-0.799
43	16.27	17.14	-0.87	0.196	-0.127	0.001	-0.125
44	17.03	15.59	1.44	0.316 #	0.228	0.004	0.225
45	-7.88	14.70	-22.58	0.078	-3.078	0.134	-3.493

Obs with Leverage > 2.00 *(average leverage)

Proceed to Diagnostic Plots (the next icon in progression). Be sure to look at the:

- 1) Normal probability plot of the studentized residuals to check for normality of residuals.
- 2) Studentized residuals versus predicted values to check for constant error.
- 3) Outlier t versus run order to look for outliers, i.e., influential values.
- 4) Box-Cox plot for power transformations.

If all the model statistics and diagnostic plots are OK, finish up with the Model Graphs icon.

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