

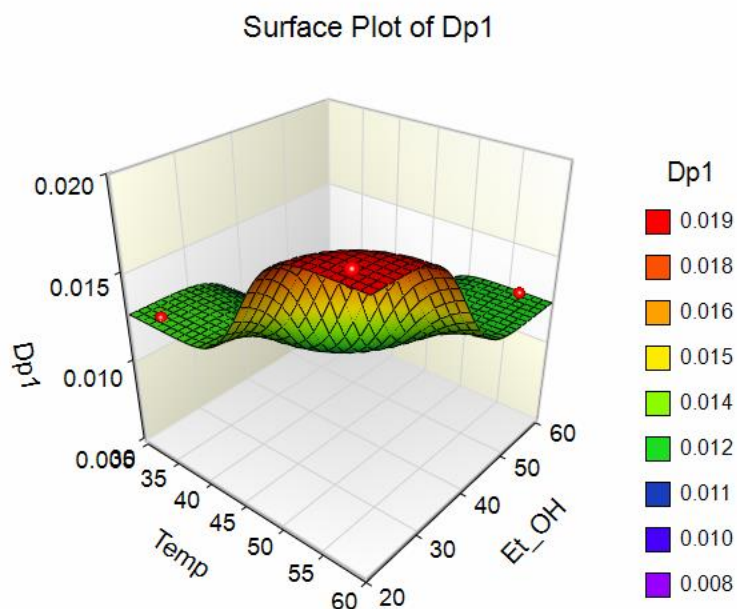
This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

WITHOUT REPLICATES

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-19_9_5.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp
Y (Vertical) Variable: Dp1
Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.

There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled

Response Dp1

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	10	45	33	57
Et_OH	10	40	22	58
Acid	10	3	1.8	4.2
Dp1	10	0.01278482	0.008204908	0.01943638

Hierarchical Model Summary Section

Number of Terms Removed	0
Number of Terms Remaining	9
R-Squared Cutoff Value	0.010000
R-Squared of Final Model	0.998104

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u²=u*u, and u3=u³=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.0001283617	1.426241E-05			0.998104
Linear	3	0.0001208381	4.027936E-05			0.939603
Quadratic	3	4.761358E-06	1.587119E-06			0.037023
Lin x Lin	3	2.762297E-06	9.207657E-07			0.021479
Lack of Fit	-1	2.156458E-07	0	0.00	0.000000	0.001677
Pure Error	1	2.814093E-08	2.814093E-08			0.000219

WARNING: One of the variables is redundant (zeroed out). You should remove it.

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There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.0001283617	1.426241E-05	506.82	0.034460	0.998104
Linear	3	0.0001208381	4.027936E-05	1431.34	0.019427	0.939603
Quadratic	3	4.761358E-06	1.587119E-06	56.40	0.097501	0.037023
Lin x Lin	3	2.762297E-06	9.207657E-07	32.72	0.127647	0.021479
Lack of Fit	-1	2.156458E-07	0	0.00	0.000000	0.001677
Pure Error	1	2.814093E-08	2.814093E-08			0.000219

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	1.151792E-05	2.879481E-06			0.089560
Et_OH	4	7.097979E-05	1.774495E-05			0.551919
Acid	4	1.62387E-07	4.059676E-08			0.001263
Lack of Fit	-1	2.156458E-07	0	0.00	0.000000	0.001677
Pure Error	1	2.814093E-08	2.814093E-08			0.000219

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	1.151792E-05	2.879481E-06	102.32	0.073993	0.089560
Et_OH	4	7.097979E-05	1.774495E-05	630.57	0.029857	0.551919
Acid	4	1.62387E-07	4.059676E-08	1.44	0.548094	0.001263
Lack of Fit	-1	2.156458E-07	0	0.00	0.000000	0.001677
Pure Error	1	2.814093E-08	2.814093E-08			0.000219

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.01751395				
Temp	1	-3.492264E-05				
Et_OH	1	-0.0003412871				
Acid	1	-0.0002478004				
Temp^2	1	3.993841E-06				
Et_OH^2	1	3.549233E-06				
Acid^2	1	0				
Temp*Et_OH	1	-2.647547E-06				
Temp*Acid	1	8.054167E-07				
Et_OH*Acid	1	6.231458E-06				

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.01751395				
Temp	1	-3.492264E-05				
Et_OH	1	-0.0003412871				
Acid	1	-0.0002478004	0.0002210377	-1.12	0.463699	0.000275
Temp^2	1	3.993841E-06				
Et_OH^2	1	3.549233E-06				
Acid^2	1	0				
Temp*Et_OH	1	-2.647547E-06	2.74581E-07	-9.64	0.065790	0.020343
Temp*Acid	1	8.054167E-07	4.118715E-06	0.20	0.877060	0.000008
Et_OH*Acid	1	6.231458E-06	2.74581E-06	2.27	0.264223	0.001127

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	7793
Et_OH	2	8040
Acid	2	-7997

Function at optimum -145.7746
 Number of Function Evaluations 502
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

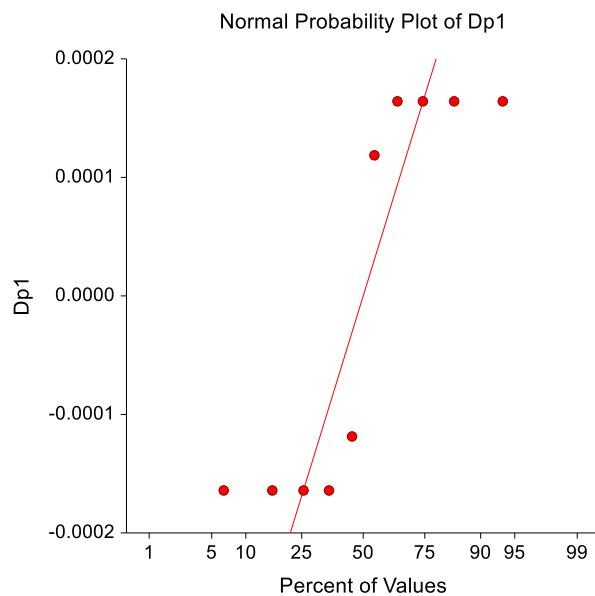
Response-Surface Regression Report

Dataset Untitled
Response Dp1

Residual Section

Row	Dp1	Predicted	Residual
1	0.01268258	0.01284676	-0.000164182
2	0.01280903	0.01264485	0.000164182
3	0.008204908	0.008040726	0.000164182
4	0.008213031	0.008377213	-0.000164182
5	0.01943638	0.0192722	0.000164182
6	0.0189525	0.01911668	-0.000164182
7	0.01201451	0.01217869	-0.000164182
8	0.01272575	0.01256157	0.000164182
9	0.01152339	0.01140477	0.000118619
10	0.01128615	0.01140477	-0.000118619

Probability Plot

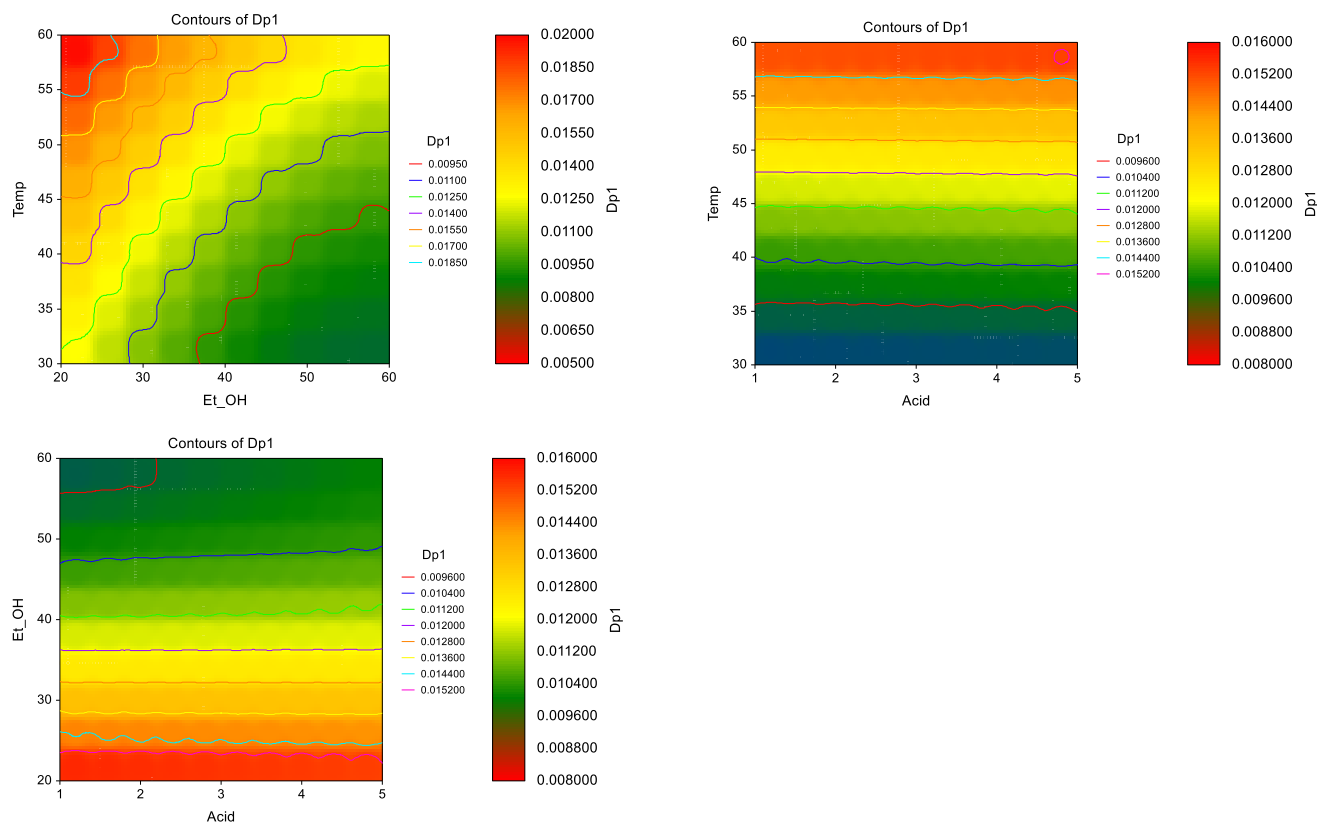


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
Response Dp1

Contour Plots

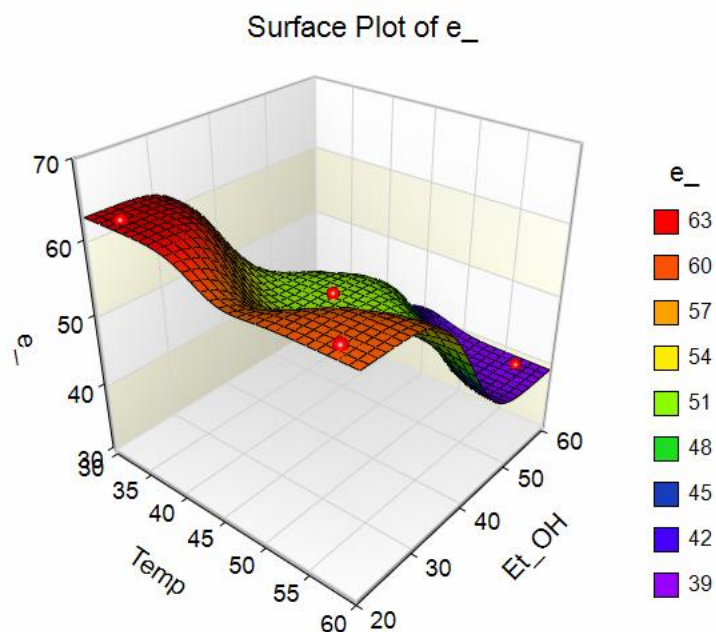


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-19_12_42.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp
Y (Vertical) Variable: e_
Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	1016.053	112.8948	244.54	0.049590	0.999486
Linear	3	1005.51	335.17	726.00	0.027274	0.989116
Quadratic	3	2.590047	0.8633488	1.87	0.482438	0.002548
Lin x Lin	3	7.952667	2.650889	5.74	0.295488	0.007823
Lack of Fit	-1	0.0603955	0	0.00	0.000000	0.000059
Pure Error	1	0.4616644	0.4616644			0.000454

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	8.977522	2.24438			0.008831
Et_OH	4	1065.582	266.3955			1.048208
Acid	4	0.06386007	0.01596502			0.000063
Lack of Fit	-1	0.0603955	0	0.00	0.000000	0.000059
Pure Error	1	0.4616644	0.4616644			0.000454

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	8.977522	2.24438	4.86	0.326324	0.008831
Et_OH	4	1065.582	266.3955	577.03	0.031211	1.048208
Acid	4	0.06386007	0.01596502	0.03	0.994222	0.000063
Lack of Fit	-1	0.0603955	0	0.00	0.000000	0.000059
Pure Error	1	0.4616644	0.4616644			0.000454

WARNING: One of the variables is redundant (zeroed out). You should remove it.

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There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	85.72359				
Temp	1	-0.5595441				
Et_OH	1	-0.3866176				
Acid	1	-0.06383304				
Temp^2	1	0.003326085				
Et_OH^2	1	-0.005405151				
Acid^2	1	1.231786E-13				
Temp*Et_OH	1	0.004599248				
Temp*Acid	1	0.00362934				
Et_OH*Acid	1	-0.003082755				

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	85.72359				
Temp	1	-0.5595441	1744097	0.00	1.000000	0.000000
Et_OH	1	-0.3866176	688817.4	0.00	1.000000	0.000000
Acid	1	-0.06383304	0.895283	-0.07	0.954686	0.000002
Temp^2	1	0.003326085	19339.22	0.00	1.000000	0.000000
Et_OH^2	1	-0.005405151	8609.47	0.00	1.000000	0.000000
Acid^2	1	1.231786E-13				
Temp*Et_OH	1	0.004599248	0.001112153	4.14	0.151043	0.007767
Temp*Acid	1	0.00362934	0.01668229	0.22	0.863624	0.000021
Et_OH*Acid	1	-0.003082755	0.01112153	-0.28	0.827858	0.000035

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	9506
Et_OH	2	12285
Acid	2	7226

Function at optimum -12891.7
 Number of Function Evaluations 501
 Maximum Functions Evaluations 500

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There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

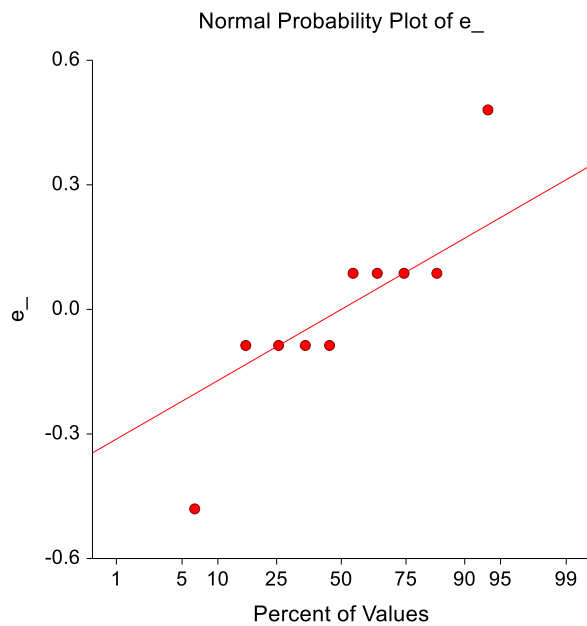
Dataset Untitled

Response e_

Residual Section

Row	e_	Predicted	Residual
1	63.1636	63.07671	0.0868875
2	62.9613	63.04819	-0.0868875
3	38.7689	38.85579	-0.0868875
4	38.6478	38.56091	0.0868875
5	59.3303	59.41719	-0.0868875
6	59.6846	59.59771	0.0868875
7	39.2569	39.17001	0.0868875
8	38.9973	39.08419	-0.0868875
9	51.8541	51.37365	0.48045
10	50.8932	51.37365	-0.48045

Probability Plot



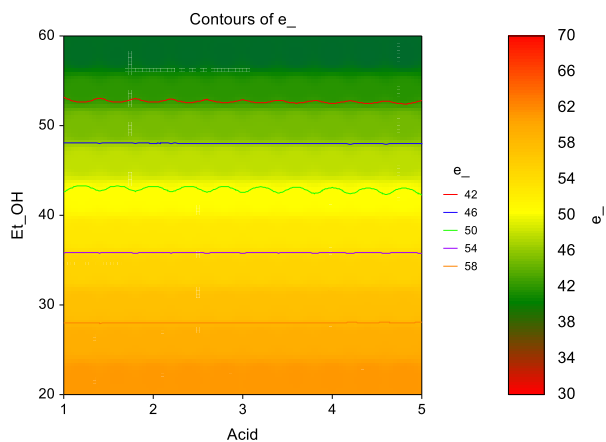
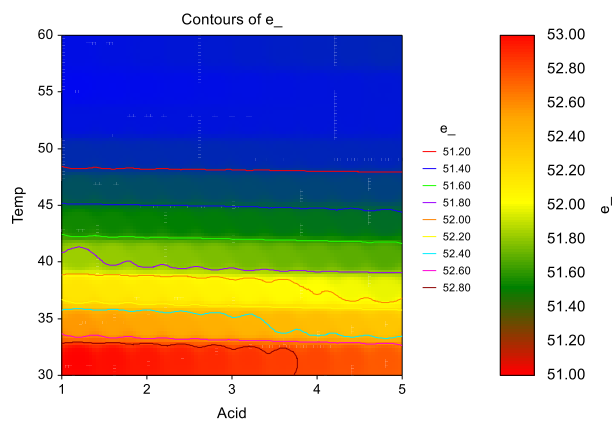
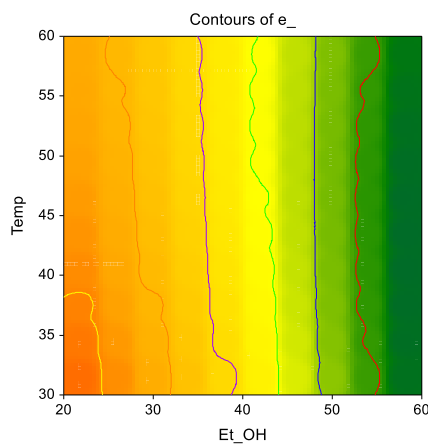
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Response-Surface Regression Report

Dataset Untitled

Response e_

Contour Plots

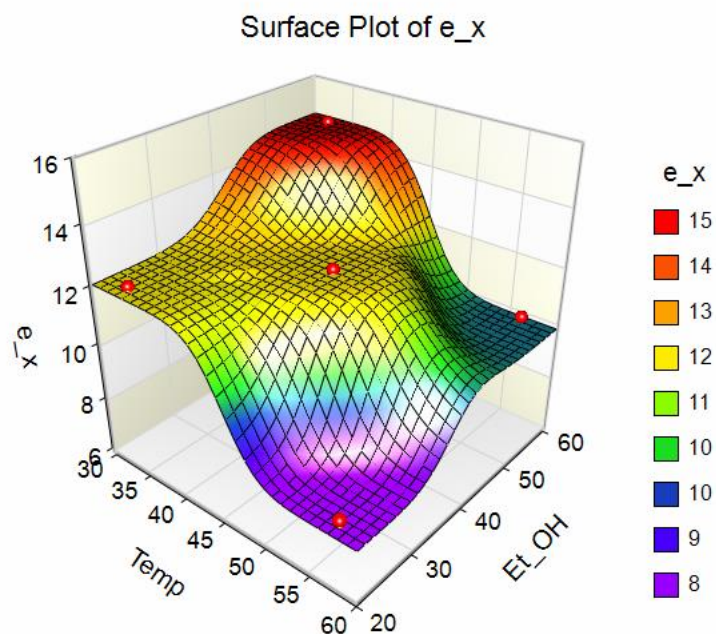


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3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-19_14_49.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp

Y (Vertical) Variable: e_x

Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	10	45	33	57
Et_OH	10	40	22	58
Acid	10	3	1.8	4.2
e_x	10	11.33565	7.6988	14.7424

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.997910

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u^2=u*u, and u3=u^3=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	55.1711	6.130122			0.997910
Linear	3	53.01424	17.67141			0.958898
Quadratic	3	1.909909	0.6366362			0.034546
Lin x Lin	3	0.2469516	0.08231721			0.004467
Lack of Fit	-1	0.105777	0	0.00	0.000000	0.001913
Pure Error	1	0.00977202	0.00977202			0.000177

WARNING: One of the variables is redundant (zeroed out). You should remove it.

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There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	55.1711	6.130122	627.31	0.030976	0.997910
Linear	3	53.01424	17.67141	1808.37	0.017284	0.958898
Quadratic	3	1.909909	0.6366362	65.15	0.090765	0.034546
Lin x Lin	3	0.2469516	0.08231721	8.42	0.246825	0.004467
Lack of Fit	-1	0.105777	0	0.00	0.000000	0.001913
Pure Error	1	0.00977202	0.00977202			0.000177

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	6.632536	1.658134			0.119966
Et_OH	4	11.63415	2.908537			0.210433
Acid	4	0.1076242	0.02690605			0.001947
Lack of Fit	-1	0.105777	0	0.00	0.000000	0.001913
Pure Error	1	0.00977202	0.00977202			0.000177

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	6.632536	1.658134	169.68	0.057506	0.119966
Et_OH	4	11.63415	2.908537	297.64	0.043442	0.210433
Acid	4	0.1076242	0.02690605	2.75	0.420761	0.001947
Lack of Fit	-1	0.105777	0	0.00	0.000000	0.001913
Pure Error	1	0.00977202	0.00977202			0.000177

WARNING: One of the variables is redundant (zeroed out). You should remove it.

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There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	15.69003				
Temp	1	-0.476658				
Et_OH	1	0.5034136				
Acid	1	0.1863602				
Temp^2	1	0.003534474				
Et_OH^2	1	-0.004942984				
Acid^2	1	4.222878E-14				
Temp*Et_OH	1	-0.0006902199				
Temp*Acid	1	-0.001742188				
Et_OH*Acid	1	-0.004144097				

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	15.69003				
Temp	1	-0.476658	253630.2	0.00	0.999999	0.000000
Et_OH	1	0.5034136	100207.7	0.00	0.999997	0.000000
Acid	1	0.1863602	0.1302535	1.43	0.388344	0.000362
Temp^2	1	0.003534474	2817.65	0.00	0.999999	0.000000
Et_OH^2	1	-0.004942984	1252.556	0.00	0.999997	0.000000
Acid^2	1	4.222878E-14				
Temp*Et_OH	1	-0.0006902199	0.0001618056	-4.27	0.146593	0.003216
Temp*Acid	1	-0.001742188	0.002427083	-0.72	0.603653	0.000091
Et_OH*Acid	1	-0.004144097	0.001618056	-2.56	0.236979	0.001159

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	5400
Et_OH	2	-5315
Acid	2	-4146

Function at optimum -75081.24
 Number of Function Evaluations 505
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

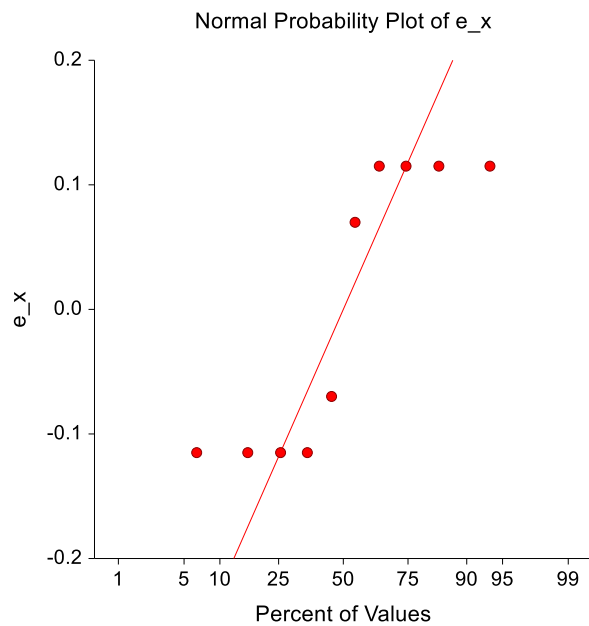
Response-Surface Regression Report

Dataset Untitled
Response e_x

Residual Section

Row	e_x	Predicted	Residual
1	12.1738	12.05881	0.1149875
2	12.0343	12.14929	-0.1149875
3	14.7424	14.85739	-0.1149875
4	14.7048	14.58981	0.1149875
5	7.6988	7.813787	-0.1149875
6	7.9189	7.803913	0.1149875
7	10.131	10.01601	0.1149875
8	9.5331	9.648088	-0.1149875
9	12.1398	12.2097	-0.0699
10	12.2796	12.2097	0.0699

Probability Plot



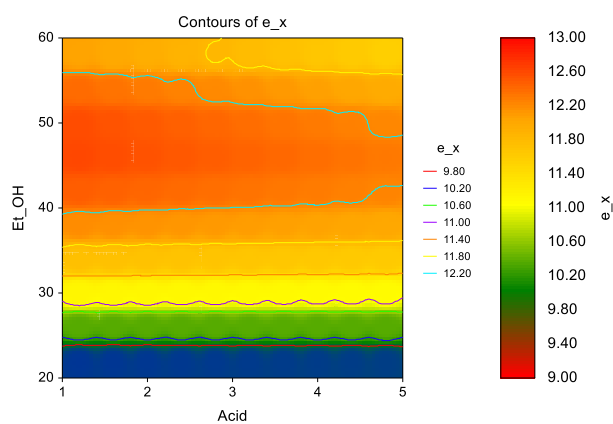
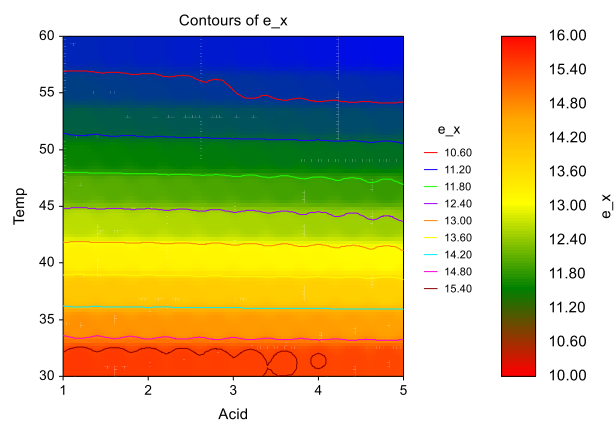
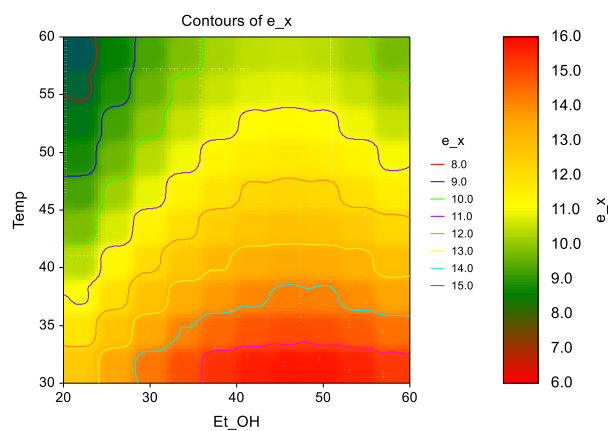
This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled

Response e_x

Contour Plots

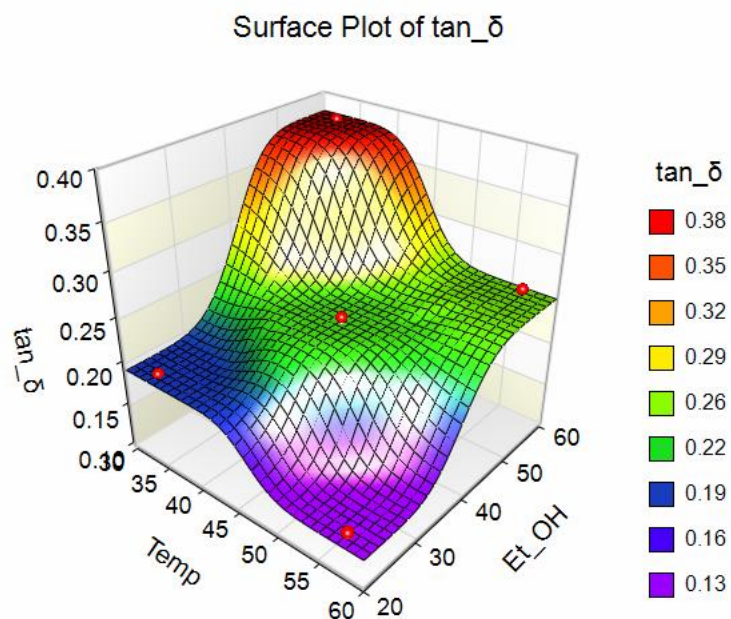


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-19_15_26.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp
Y (Vertical) Variable: \tan_{δ}
Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	10	45	33	57
Et_OH	10	40	22	58
Acid	10	3	1.8	4.2
tan_δ	10	0.238498	0.1297617	0.3804822

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.999004

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u^2=u*u, and u3=u^3=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.06799321	0.007554801			0.999004
Linear	3	0.06561477	0.02187159			0.964059
Quadratic	3	1.599392E-06	5.331307E-07			0.000023
Lin x Lin	3	0.002376845	0.0007922815			0.034922
Lack of Fit	-1	4.207352E-05	0	0.00	0.000000	0.000618
Pure Error	1	2.568423E-05	2.568423E-05			0.000377

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.06799321	0.007554801	294.14	0.045222	0.999004
Linear	3	0.06561477	0.02187159	851.56	0.025184	0.964059
Quadratic	3	1.599392E-06	5.331307E-07	0.02	0.993867	0.000023
Lin x Lin	3	0.002376845	0.0007922815	30.85	0.131411	0.034922
Lack of Fit	-1	4.207352E-05	0	0.00	0.000000	0.000618
Pure Error	1	2.568423E-05	2.568423E-05			0.000377

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	0.004905241	0.00122631			0.072071
Et_OH	4	0.05265907	0.01316477			0.773704
Acid	4	5.614938E-05	1.403734E-05			0.000825
Lack of Fit	-1	4.207352E-05	0	0.00	0.000000	0.000618
Pure Error	1	2.568423E-05	2.568423E-05			0.000377

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	0.004905241	0.00122631	47.75	0.108070	0.072071
Et_OH	4	0.05265907	0.01316477	512.56	0.033114	0.773704
Acid	4	5.614938E-05	1.403734E-05	0.55	0.752430	0.000825
Lack of Fit	-1	4.207352E-05	0	0.00	0.000000	0.000618
Pure Error	1	2.568423E-05	2.568423E-05			0.000377

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.1150295				
Temp	1	-0.002303621				
Et_OH	1	0.008549794				
Acid	1	0.005788954				
Temp^2	1	1.953336E-05				
Et_OH^2	1	-5.595658E-06				
Acid^2	1	0				
Temp*Et_OH	1	-7.916055E-05				
Temp*Acid	1	-8.089179E-05				
Et_OH*Acid	1	-8.516383E-05				

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.1150295				
Temp	1	-0.002303621				
Et_OH	1	0.008549794				
Acid	1	0.005788954	0.006677754	0.87	0.545310	0.000284
Temp^2	1	1.953336E-05				
Et_OH^2	1	-5.595658E-06				
Acid^2	1	0				
Temp*Et_OH	1	-7.916055E-05	8.295346E-06	-9.54	0.066470	0.034365
Temp*Acid	1	-8.089179E-05	0.0001244302	-0.65	0.633024	0.000159
Et_OH*Acid	1	-8.516383E-05	8.295346E-05	-1.03	0.491630	0.000398

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	13905
Et_OH	2	11618
Acid	2	13863

Function at optimum -38928.74
 Number of Function Evaluations 503
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

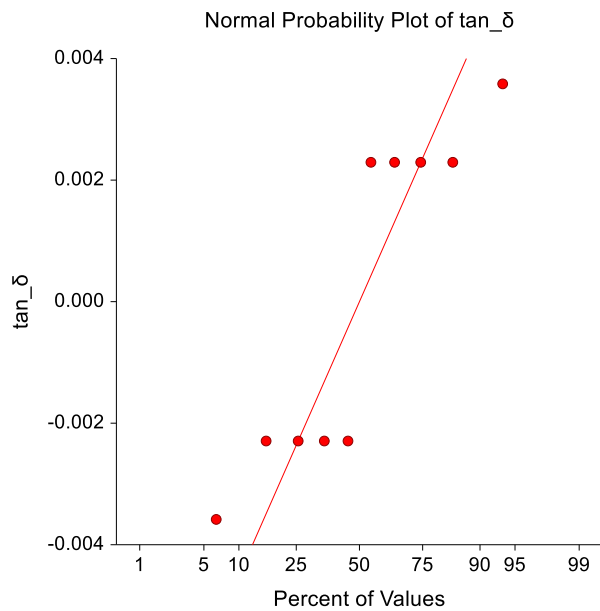
Dataset Untitled

Response tan_δ

Residual Section

Row	tan_δ	Predicted	Residual
1	0.1927344	0.1904411	0.002293292
2	0.191138	0.1934313	-0.002293292
3	0.3802636	0.3825569	-0.002293292
4	0.3804822	0.3781889	0.002293292
5	0.1297617	0.132055	-0.002293292
6	0.1326791	0.1303858	0.002293292
7	0.2580693	0.255776	0.002293292
8	0.2444554	0.2467487	-0.002293292
9	0.2341146	0.2376982	-0.00358359
10	0.2412817	0.2376982	0.00358359

Probability Plot

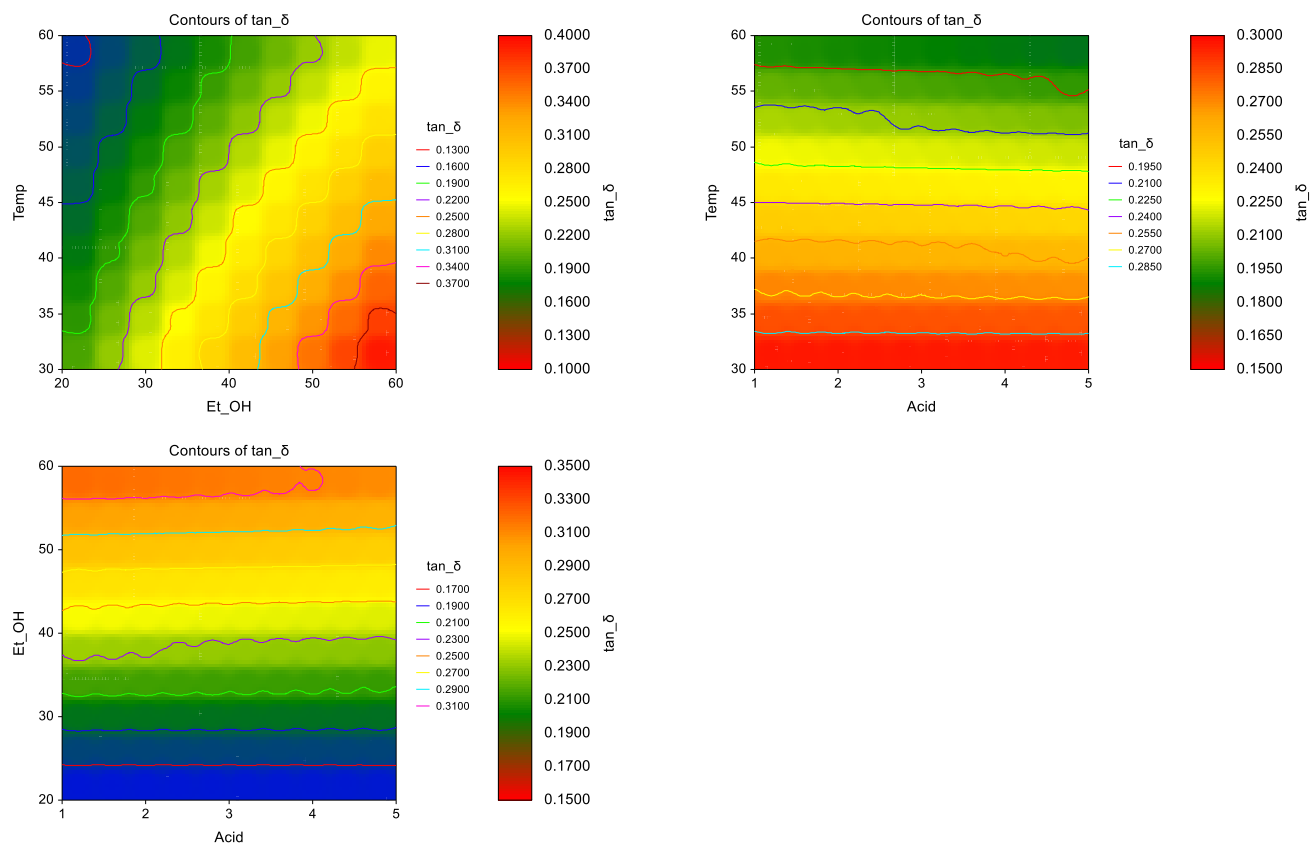


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
Response tan_δ

Contour Plots



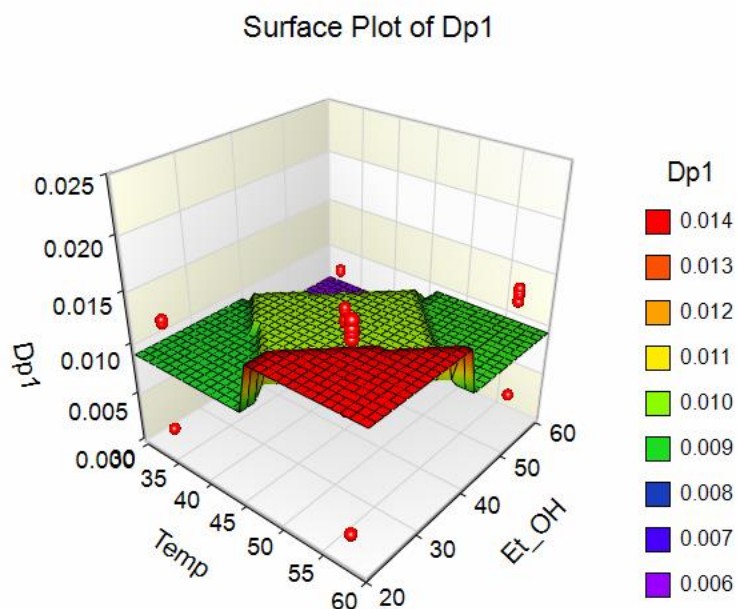
This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

WITH REPLICATES

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-18_0_12.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp
Y (Vertical) Variable: Dp1
Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	30	45	33	57
Et_OH	30	40	22	58
Acid	30	3	1.8	4.2
Dp1	30	0.009701393	0.001742496	0.0204133

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.165642

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u²=u*u, and u3=u³=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.0001713065	1.903405E-05	0.44	0.896259	0.165642
Linear	3	0.0001647367	5.491223E-05	1.27	0.310697	0.159289
Quadratic	3	2.029528E-06	6.765094E-07	0.02	0.997231	0.001962
Lin x Lin	3	4.540229E-06	1.51341E-06	0.04	0.990919	0.004390
Total Error	20	0.0008628933	4.314467E-05			0.834358
Lack of Fit	-1	1.455034E-07	0	0.00	0.000000	0.000141
Pure Error	21	0.0008627478	4.108323E-05			0.834218

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.0001713065	1.903405E-05	0.46	0.882870	0.165642
Linear	3	0.0001647367	5.491223E-05	1.34	0.289272	0.159289
Quadratic	3	2.029528E-06	6.765094E-07	0.02	0.997028	0.001962
Lin x Lin	3	4.540229E-06	1.51341E-06	0.04	0.990259	0.004390
Total Error	20	0.0008628933	4.314467E-05			0.834358
Lack of Fit	-1	1.455034E-07	0	0.00	0.000000	0.000141
Pure Error	21	0.0008627478	4.108323E-05			0.834218

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	9.393285E-05	2.348321E-05	0.54	0.705150	0.090827
Et_OH	4	8.182347E-05	2.045587E-05	0.47	0.754212	0.079118
Acid	4	9.037245E-08	2.259311E-08	0.00	0.999999	0.000087
Total Error	20	0.0008628933	4.314467E-05			0.834358
Lack of Fit	-1	1.455034E-07	0	0.00	0.000000	0.000141
Pure Error	21	0.0008627478	4.108323E-05			0.834218

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	9.393285E-05	2.348321E-05	0.57	0.686163	0.090827
Et_OH	4	8.182347E-05	2.045587E-05	0.50	0.737479	0.079118
Acid	4	9.037245E-08	2.259311E-08	0.00	0.999999	0.000087
Total Error	20	0.0008628933	4.314467E-05			0.834358
Lack of Fit	-1	1.455034E-07	0	0.00	0.000000	0.000141
Pure Error	21	0.0008627478	4.108323E-05			0.834218

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	-0.005761526				
Temp	1	0.000653411	0.00191397	0.34	0.736370	0.004862
Et_OH	1	-1.597344E-05	0.0003438766	-0.05	0.963411	0.000090
Acid	1	2.655059E-05	0.004996893	0.01	0.995813	0.000001
Temp^2	1	-4.515589E-06	2.081999E-05	-0.22	0.830493	0.001962
Et_OH^2	1	2.711622E-13				
Acid^2	1	0				
Temp*Et_OH	1	-1.995295E-06	6.207321E-06	-0.32	0.751210	0.004311
Temp*Acid	1	-2.720703E-06	9.310981E-05	-0.03	0.976978	0.000036
Et_OH*Acid	1	2.014994E-06	6.207321E-05	0.03	0.974426	0.000044

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	-0.005761526				
Temp	1	0.000653411	0.001867686	0.35	0.729935	0.004862
Et_OH	1	-1.597344E-05	0.0003355609	-0.05	0.962483	0.000090
Acid	1	2.655059E-05	0.004876057	0.01	0.995707	0.000001
Temp^2	1	-4.515589E-06	2.031651E-05	-0.22	0.826257	0.001962
Et_OH^2	1	2.711622E-13				
Acid^2	1	0				
Temp*Et_OH	1	-1.995295E-06	6.057214E-06	-0.33	0.745110	0.004311
Temp*Acid	1	-2.720703E-06	9.085821E-05	-0.03	0.976394	0.000036
Et_OH*Acid	1	2.014994E-06	6.057214E-05	0.03	0.973777	0.000044

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	13573
Et_OH	2	13900
Acid	2	11949

Function at optimum -1305.955
 Number of Function Evaluations 503
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response Dp1

Residual Section

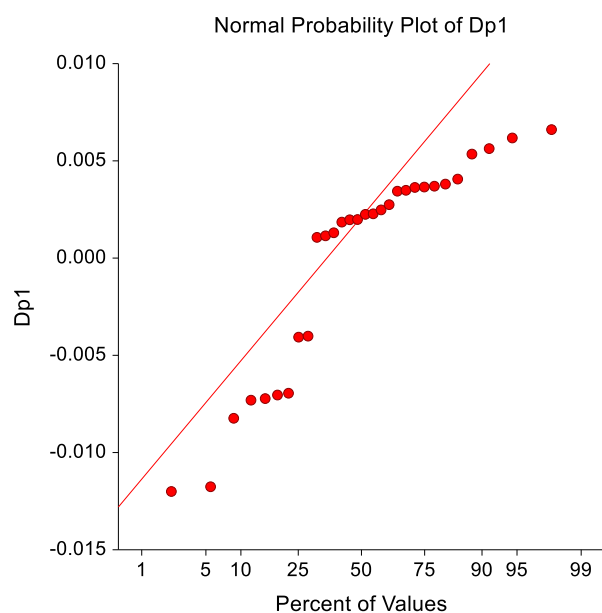
Row	Dp1	Predicted	Residual
1	0.01268258	0.009049536	0.00363304
2	0.01280903	0.009004169	0.00380486
3	0.008204908	0.006234654	0.001970254
4	0.008213031	0.006363383	0.001849648
5	0.01943638	0.01380668	0.005629706
6	0.0189525	0.0136046	0.005347902
7	0.01201451	0.00926786	0.002746645
8	0.01272575	0.009239876	0.003485872
9	0.01152339	0.01022159	0.0013018
10	0.01128615	0.01022159	0.001064562
11	0.01248995	0.009049536	0.003440412
12	0.01265775	0.009004169	0.003653577
13	0.008511748	0.006234654	0.002277094
14	0.008346429	0.006363383	0.001983046
15	0.0204133	0.01380668	0.006606622
16	0.01978213	0.0136046	0.00617753
17	0.01332965	0.00926786	0.004061788
18	0.01293684	0.009239876	0.003696963
19	0.01246946	0.01022159	0.002247873
20	0.01136683	0.01022159	0.001145242
21	0.001742496	0.009049536	-0.00730704
22	0.001779322	0.009004169	-0.007224847
23	0.002220893	0.006234654	-0.004013761
24	0.002297098	0.006363383	-0.004066285
25	0.001803939	0.01380668	-0.01200274
26	0.001845578	0.0136046	-0.01175902
27	0.002225836	0.00926786	-0.007042024
28	0.002290629	0.009239876	-0.006949247
29	0.001984109	0.01022159	-0.008237479
30	0.01269959	0.01022159	0.002478001

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

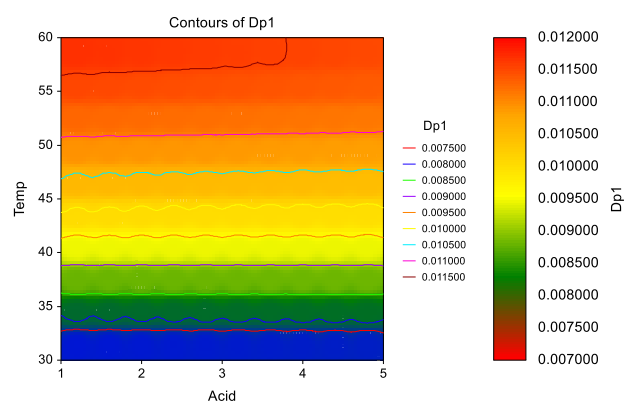
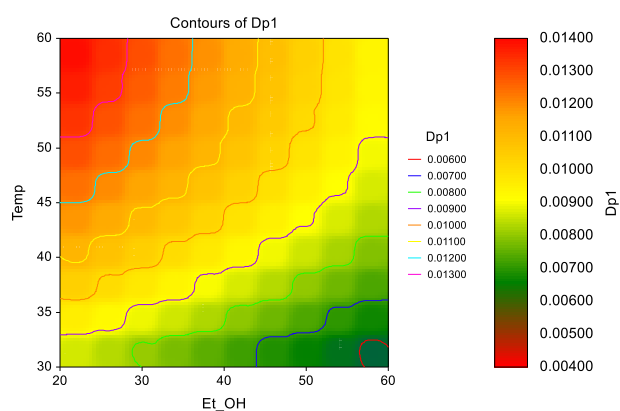
Response-Surface Regression Report

Dataset Untitled
Response Dp1

Probability Plot



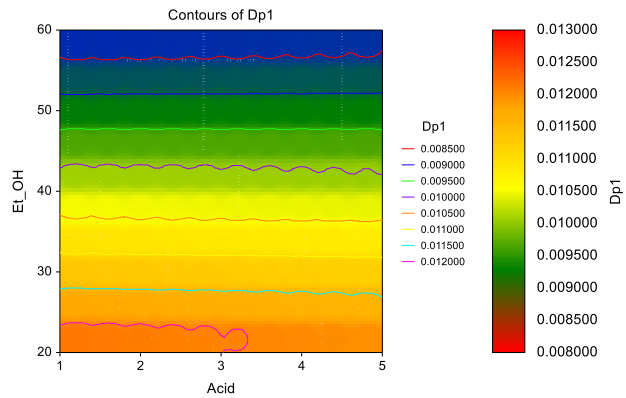
Contour Plots



**This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).**

Response-Surface Regression Report

Dataset Untitled
Response Dp1

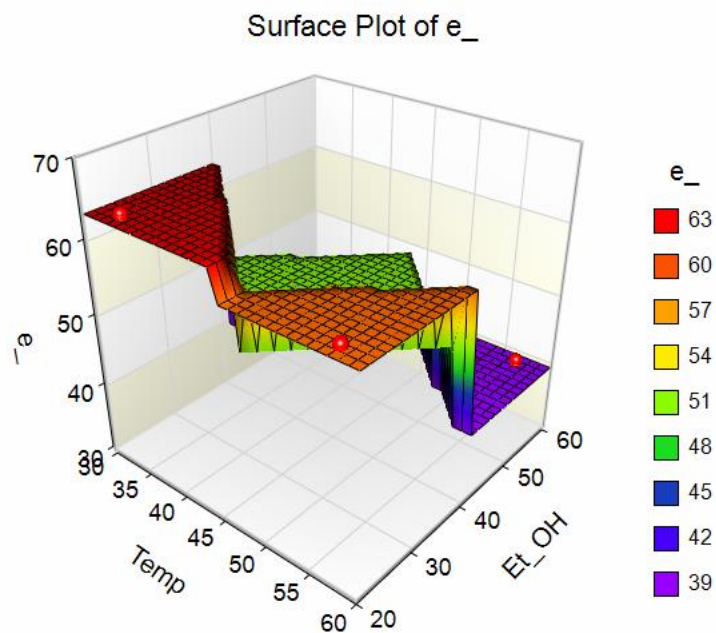


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-18_11_25.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp

Y (Vertical) Variable: e_

Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	30	45	33	57
Et_OH	30	40	22	58
Acid	30	3	1.8	4.2
e_	30	50.4588	38.6478	63.9226

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.998428

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u^2=u*u, and u3=u^3=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	2991.925	332.4362	1411.48	0.000000	0.998428
Linear	3	2962.28	987.4268	4192.48	0.000000	0.988535
Quadratic	3	3.239667	1.079889	4.59	0.013383	0.001081
Lin x Lin	3	26.40538	8.801793	37.37	0.000000	0.008812
Total Error	20	4.710468	0.2355234			0.001572
Lack of Fit	-1	0.02673337	0	0.00	0.000000	0.000009
Pure Error	21	4.683734	0.223035			0.001563

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	2991.925	332.4362	1490.51	0.000000	0.998428
Linear	3	2962.28	987.4268	4427.23	0.000000	0.988535
Quadratic	3	3.239667	1.079889	4.84	0.010273	0.001081
Lin x Lin	3	26.40538	8.801793	39.46	0.000000	0.008812
Total Error	20	4.710468	0.2355234			0.001572
Lack of Fit	-1	0.02673337	0	0.00	0.000000	0.000009
Pure Error	21	4.683734	0.223035			0.001563

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	51.51135	12.87784	54.68	0.000000	0.017190
Et_OH	4	2966.65	741.6624	3149.00	0.000000	0.989993
Acid	4	0.1696074	0.04240184	0.18	0.946064	0.000057
Total Error	20	4.710468	0.2355234			0.001572
Lack of Fit	-1	0.02673337	0	0.00	0.000000	0.000009
Pure Error	21	4.683734	0.223035			0.001563

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	51.51135	12.87784	57.74	0.000000	0.017190
Et_OH	4	2966.65	741.6624	3325.32	0.000000	0.989993
Acid	4	0.1696074	0.04240184	0.19	0.940889	0.000057
Total Error	20	4.710468	0.2355234			0.001572
Lack of Fit	-1	0.02673337	0	0.00	0.000000	0.000009
Pure Error	21	4.683734	0.223035			0.001563

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	77.1606				
Temp	1	0.22589	0.1414127	1.60	0.125861	0.000201
Et_OH	1	-0.8314691	0.02540716	-32.73	0.000000	0.084174
Acid	1	-0.2329489	0.369193	-0.63	0.535206	0.000031
Temp^2	1	-0.00570515	0.001538275	-3.71	0.001388	0.001081
Et_OH^2	1	1.637746E-10	0.0005443871	0.00	1.000000	0.000000
Acid^2	1	9.616769E-13	3.196616E-06	0.00	1.000000	0.000000
Temp*Et_OH	1	0.004845563	0.0004586249	10.57	0.000000	0.008774
Temp*Acid	1	0.004734375	0.006879374	0.69	0.499233	0.000037
Et_OH*Acid	1	-0.000501929	0.004586249	-0.11	0.913942	0.000001

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	77.1606				
Temp	1	0.22589	0.1376125	1.64	0.115588	0.000201
Et_OH	1	-0.8314691	0.02472439	-33.63	0.000000	0.084174
Acid	1	-0.2329489	0.3592717	-0.65	0.523759	0.000031
Temp^2	1	-0.00570515	0.001496936	-3.81	0.001019	0.001081
Et_OH^2	1	1.637746E-10	0.0005297577	0.00	1.000000	0.000000
Acid^2	1	9.616769E-13	3.110713E-06	0.00	1.000000	0.000000
Temp*Et_OH	1	0.004845563	0.0004463002	10.86	0.000000	0.008774
Temp*Acid	1	0.004734375	0.006694503	0.71	0.487215	0.000037
Et_OH*Acid	1	-0.000501929	0.004463002	-0.11	0.911523	0.000001

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	5609
Et_OH	2	-2584
Acid	2	-4937

Function at optimum -382582
 Number of Function Evaluations 503
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_

Residual Section

Row	e_	Predicted	Residual
1	63.1636	63.46966	-0.3060581
2	62.9613	63.25904	-0.2977414
3	38.7689	39.26078	-0.4918753
4	38.6478	39.00679	-0.3589919
5	59.3303	59.33088	-0.0005747747
6	59.6846	59.39296	0.2916419
7	39.2569	39.30856	-0.05165858
8	38.9973	39.32727	-0.3299752
9	51.8541	51.11603	0.7380667
10	50.8932	51.11603	-0.2228333
11	63.4229	63.46966	-0.04675811
12	63.052	63.25904	-0.2070414
13	38.8964	39.26078	-0.3643752
14	38.7329	39.00679	-0.2738919
15	58.8028	59.33088	-0.5280748
16	59.1431	59.39296	-0.2498581
17	38.9219	39.30856	-0.3866586
18	38.9412	39.32727	-0.3860753
19	50.8904	51.11603	-0.2256333
20	51.0204	51.11603	-0.09563329
21	63.9226	63.46966	0.4529419
22	63.6637	63.25904	0.4046586
23	40.0169	39.26078	0.7561247
24	39.7398	39.00679	0.7330081
25	59.7594	59.33088	0.4285252
26	59.4513	59.39296	0.05834189
27	39.847	39.30856	0.5384414
28	39.9432	39.32727	0.6159248
29	50.8451	51.11603	-0.2709333
30	51.193	51.11603	0.07696671

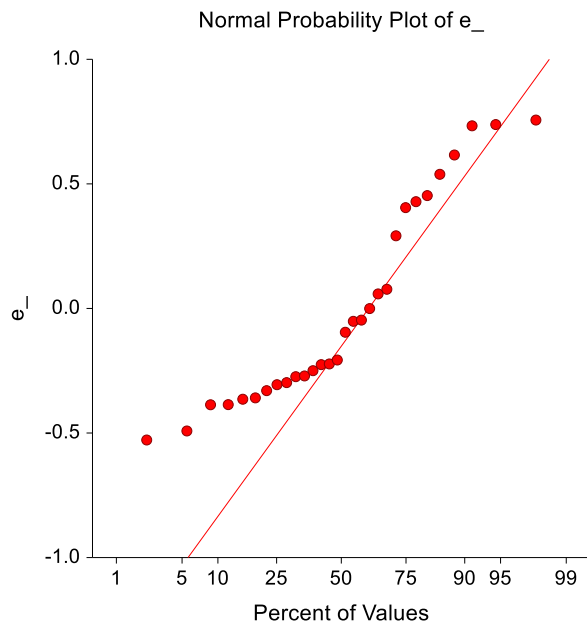
This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

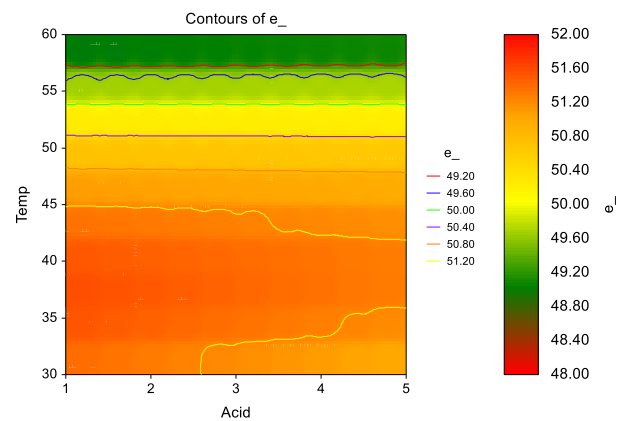
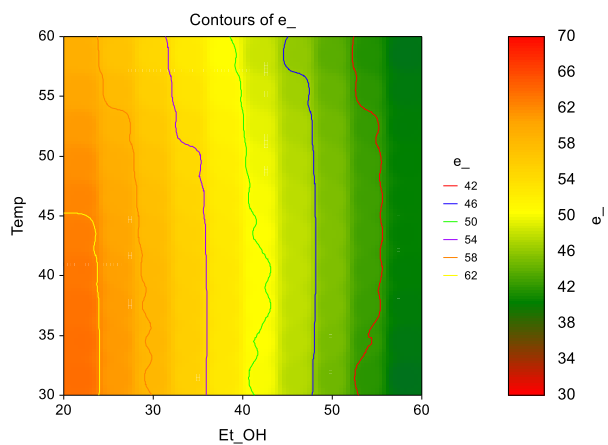
Dataset Untitled

Response e_

Probability Plot



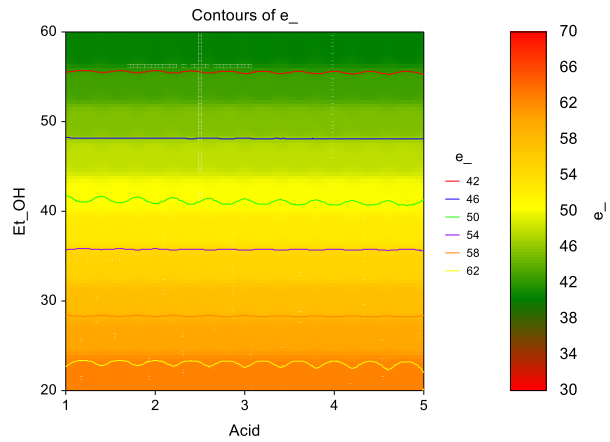
Contour Plots



**This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).**

Response-Surface Regression Report

Dataset Untitled
Response e_

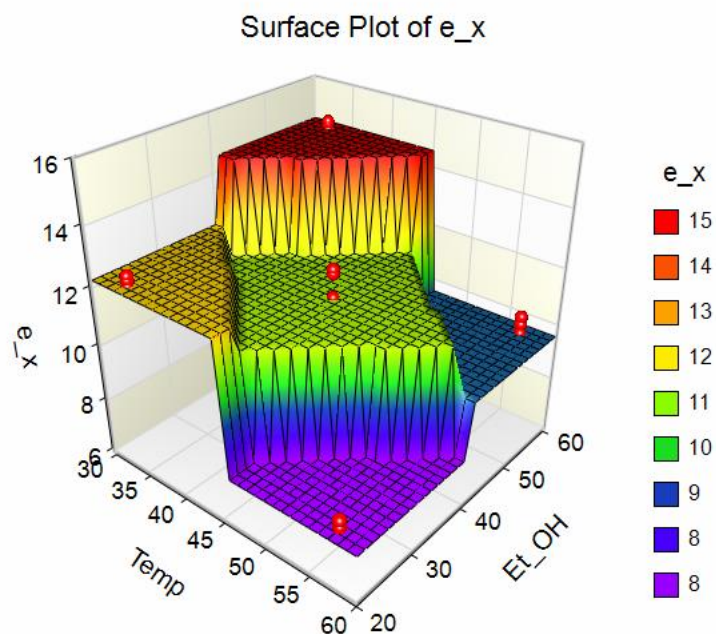


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-18_24_32.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp

Y (Vertical) Variable: e_x

Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	30	45	33	57
Et_OH	30	40	22	58
Acid	30	3	1.8	4.2
e_x	30	11.0668	7.2977	14.7884

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.976242

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u^2=u*u, and u3=u^3=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	166.9159	18.54621	91.31	0.000000	0.976242
Linear	3	166.025	55.34168	272.48	0.000000	0.971032
Quadratic	3	0.6014602	0.2004867	0.99	0.418845	0.003518
Lin x Lin	3	0.2893678	0.09645593	0.47	0.703248	0.001692
Total Error	20	4.062128	0.2031064			0.023758
Lack of Fit	-1	0.09545771	0	0.00	0.000000	0.000558
Pure Error	21	3.966671	0.1888891			0.023200

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	166.9159	18.54621	98.19	0.000000	0.976242
Linear	3	166.025	55.34168	292.99	0.000000	0.971032
Quadratic	3	0.6014602	0.2004867	1.06	0.386549	0.003518
Lin x Lin	3	0.2893678	0.09645593	0.51	0.679282	0.001692
Total Error	20	4.062128	0.2031064			0.023758
Lack of Fit	-1	0.09545771	0	0.00	0.000000	0.000558
Pure Error	21	3.966671	0.1888891			0.023200

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	139.8056	34.95141	172.08	0.000000	0.817682
Et_OH	4	27.31805	6.829513	33.63	0.000000	0.159775
Acid	4	0.08154867	0.02038717	0.10	0.981070	0.000477
Total Error	20	4.062128	0.2031064			0.023758
Lack of Fit	-1	0.09545771	0	0.00	0.000000	0.000558
Pure Error	21	3.966671	0.1888891			0.023200

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	139.8056	34.95141	185.04	0.000000	0.817682
Et_OH	4	27.31805	6.829513	36.16	0.000000	0.159775
Acid	4	0.08154867	0.02038717	0.11	0.978433	0.000477
Total Error	20	4.062128	0.2031064			0.023758
Lack of Fit	-1	0.09545771	0	0.00	0.000000	0.000558
Pure Error	21	3.966671	0.1888891			0.023200

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	12.71866				
Temp	1	0.03223989	0.1313207	0.25	0.808567	0.000072
Et_OH	1	0.07252014	0.02359396	3.07	0.005992	0.011223
Acid	1	-0.1591103	0.3428454	-0.46	0.647597	0.000256
Temp^2	1	-0.002458218	0.001428495	-1.72	0.100714	0.003518
Et_OH^2	1	8.89784E-11				
Acid^2	1	3.849698E-13				
Temp*Et_OH	1	-0.0004417438	0.0004258949	-1.04	0.312015	0.001278
Temp*Acid	1	0.002048611	0.006388423	0.32	0.751783	0.000122
Et_OH*Acid	1	0.002112654	0.004258949	0.50	0.625266	0.000292

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	12.71866				
Temp	1	0.03223989	0.1266412	0.25	0.801526	0.000072
Et_OH	1	0.07252014	0.0227532	3.19	0.004433	0.011223
Acid	1	-0.1591103	0.3306282	-0.48	0.635325	0.000256
Temp^2	1	-0.002458218	0.001377591	-1.78	0.088810	0.003518
Et_OH^2	1	8.89784E-11				
Acid^2	1	3.849698E-13				
Temp*Et_OH	1	-0.0004417438	0.0004107183	-1.08	0.294335	0.001278
Temp*Acid	1	0.002048611	0.006160774	0.33	0.742789	0.000122
Et_OH*Acid	1	0.002112654	0.004107183	0.51	0.612357	0.000292

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	7919
Et_OH	2	6444
Acid	2	-7871

Function at optimum -409556.9
 Number of Function Evaluations 503
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response e_x

Residual Section

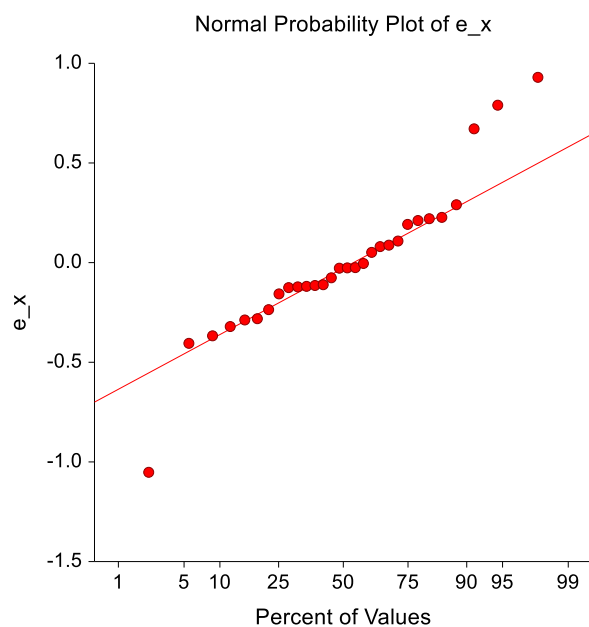
Row	e_x	Predicted	Residual
1	12.1738	12.29927	-0.1254665
2	12.0343	12.1912	-0.1568999
3	14.7424	14.5221	0.2202999
4	14.7048	14.59657	0.1082332
5	7.6988	7.618533	0.08026679
6	7.9189	7.628467	0.2904335
7	10.131	9.459701	0.6712999
8	9.5331	9.652166	-0.1190668
9	12.1398	11.34998	0.7898167
10	12.2796	11.34998	0.9296167
11	12.3869	12.29927	0.08763345
12	12.1869	12.1912	-0.004299878
13	14.2343	14.5221	-0.2878001
14	14.4857	14.59657	-0.1108668
15	7.2977	7.618533	-0.3208332
16	7.5523	7.628467	-0.07616655
17	9.0924	9.459701	-0.3673001
18	9.3708	9.652166	-0.2813668
19	11.114	11.34998	-0.2359833
20	11.3236	11.34998	-0.02638331
21	12.5263	12.29927	0.2270335
22	12.1632	12.1912	-0.02799988
23	14.4004	14.5221	-0.1217001
24	14.7884	14.59657	0.1918332
25	7.6699	7.618533	0.05136679
26	7.6034	7.628467	-0.02506655
27	9.3449	9.459701	-0.1148001
28	9.8634	9.652166	0.2112332
29	10.2979	11.34998	-1.052083
30	10.945	11.34998	-0.4049833

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

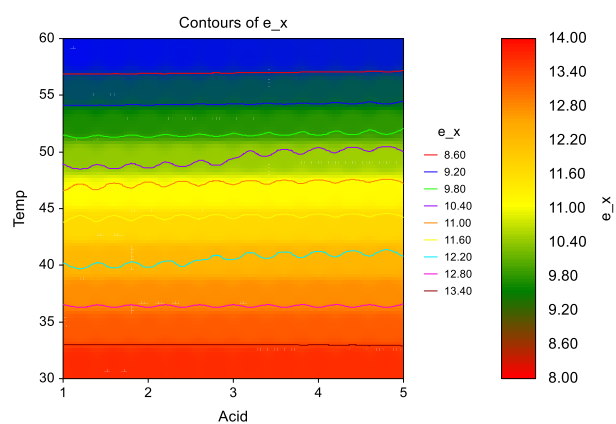
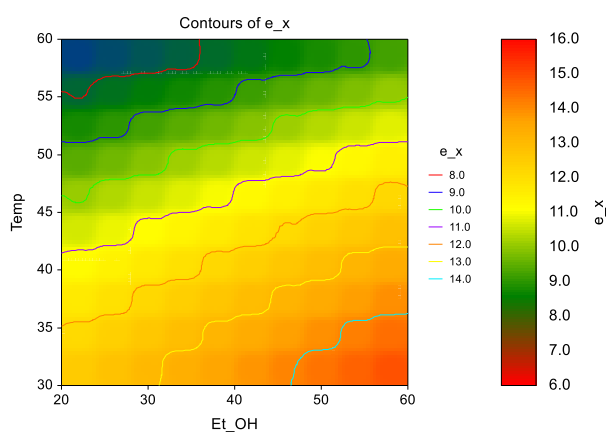
Response-Surface Regression Report

Dataset Untitled
Response e_x

Probability Plot



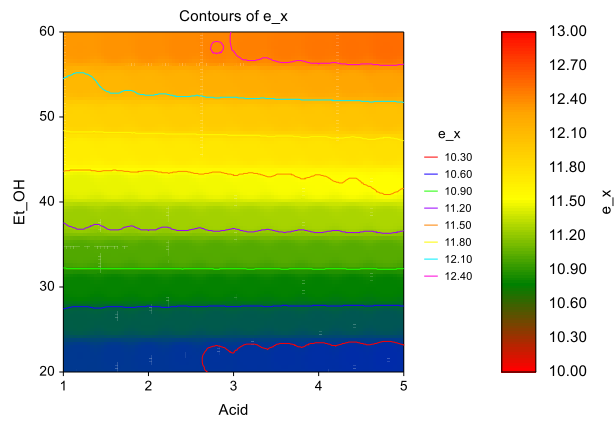
Contour Plots



**This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).**

Response-Surface Regression Report

Dataset Untitled
Response e_x

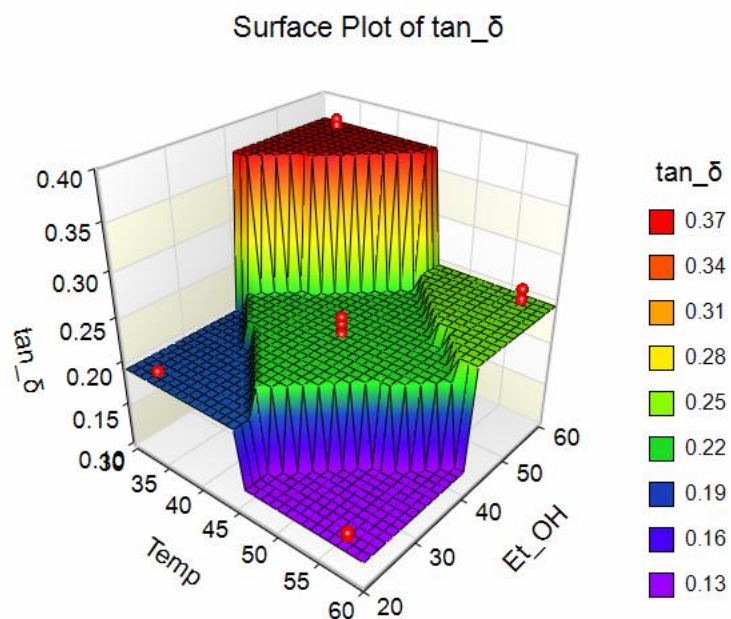


This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

3D Surface Plots

Dataset Untitled

3D Surface Plot



Procedure Input Settings

Autosaved Template File

C:\Users\Mota\Documents\NCSS 2021\Procedure Templates\Autosave\3D Surface Plots - Autosaved
2021_6_21-18_29_28.t92

Variables Tab

-- Variables -----

X (Horizontal) Variable: Temp
Y (Vertical) Variable: \tan_{δ}
Z (Depth) Variable: Et_OH

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Descriptive Statistics Section

Variable	Count	Mean	Minimum	Maximum
Temp	30	45	33	57
Et_OH	30	40	22	58
Acid	30	3	1.8	4.2
tan_δ	30	0.2317641	0.1241046	0.3804822

Hierarchical Model Summary Section

Number of Terms Removed 0
 Number of Terms Remaining 9
 R-Squared Cutoff Value 0.010000
 R-Squared of Final Model 0.991156

Coded Hierarchical Model

	A	B	C
A Temp	2	1(11)	1(11)
B Et_OH		2	1(11)
C Acid			2

Notes:

For off-diagonal entries:

1=u1w1, 2=u1w2, 3=u2w1, 4=u2w2, 5=u1w3, 6=u3w1, 7=u2w3, 8=u3w2, 9=u3w3.

For diagonal entries:

1=u1, 2=u2, 3=u3.

Where u1=u, u2=u²=u*u, and u3=u³=u*u*u.

Sequential ANOVA Section

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.1925688	0.02139653	249.04	0.000000	0.991156
Linear	3	0.18563	0.06187666	720.19	0.000000	0.955442
Quadratic	3	0.0007134923	0.0002378308	2.77	0.068447	0.003672
Lin x Lin	3	0.006225315	0.002075105	24.15	0.000001	0.032042
Total Error	20	0.001718332	8.591658E-05			0.008844
Lack of Fit	-1	3.570162E-05	0	0.00	0.000000	0.000184
Pure Error	21	0.00168263	8.012524E-05			0.008661

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Sequential ANOVA Section Using Pure Error

Source	df	Sequential Sum-Squares	Mean Square	F-Ratio	Prob Level	Incremental R-Squared
Regression	9	0.1925688	0.02139653	267.04	0.000000	0.991156
Linear	3	0.18563	0.06187666	772.25	0.000000	0.955442
Quadratic	3	0.0007134923	0.0002378308	2.97	0.055253	0.003672
Lin x Lin	3	0.006225315	0.002075105	25.90	0.000000	0.032042
Total Error	20	0.001718332	8.591658E-05			0.008844
Lack of Fit	-1	3.570162E-05	0	0.00	0.000000	0.000184
Pure Error	21	0.00168263	8.012524E-05			0.008661

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	0.06330471	0.01582618	184.20	0.000000	0.325831
Et_OH	4	0.135431	0.03385774	394.08	0.000000	0.697066
Acid	4	5.842429E-05	1.460607E-05	0.17	0.951174	0.000301
Total Error	20	0.001718332	8.591658E-05			0.008844
Lack of Fit	-1	3.570162E-05	0	0.00	0.000000	0.000184
Pure Error	21	0.00168263	8.012524E-05			0.008661

WARNING: One of the variables is redundant (zeroed out). You should remove it.

ANOVA Section Using Pure Error

Factor	df	Last Sum-Squares	Mean Square	F-Ratio	Prob Level	Term R-Squared
Temp	4	0.06330471	0.01582618	197.52	0.000000	0.325831
Et_OH	4	0.135431	0.03385774	422.56	0.000000	0.697066
Acid	4	5.842429E-05	1.460607E-05	0.18	0.945017	0.000301
Total Error	20	0.001718332	8.591658E-05			0.008844
Lack of Fit	-1	3.570162E-05	0	0.00	0.000000	0.000184
Pure Error	21	0.00168263	8.012524E-05			0.008661

WARNING: One of the variables is redundant (zeroed out). You should remove it.

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Estimation Section

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.2825023				
Temp	1	-0.008684583	0.002700909	-3.22	0.004341	0.004572
Et_OH	1	0.007255376	0.0004852634	14.95	0.000000	0.098855
Acid	1	-0.001380894	0.007051394	-0.20	0.846717	0.000017
Temp^2	1	8.466649E-05	2.938024E-05	2.88	0.009222	0.003672
Et_OH^2	1	-5.416626E-12				
Acid^2	1	-2.005234E-14				
Temp*Et_OH	1	-7.43549E-05	8.759496E-06	-8.49	0.000000	0.031864
Temp*Acid	1	-3.193634E-07	0.0001313924	0.00	0.998085	0.000000
Et_OH*Acid	1	5.562052E-05	8.759496E-05	0.63	0.532643	0.000178

Estimation Section Using Pure Error

Parameter	df	Regression Coefficient	Standard Error	T-Ratio	Prob Level	Last R-Squared
Intercept	1	0.2825023				
Temp	1	-0.008684583	0.002608292	-3.33	0.003182	0.004572
Et_OH	1	0.007255376	0.0004686232	15.48	0.000000	0.098855
Acid	1	-0.001380894	0.006809593	-0.20	0.841254	0.000017
Temp^2	1	8.466649E-05	2.837276E-05	2.98	0.007074	0.003672
Et_OH^2	1	-5.416626E-12				
Acid^2	1	-2.005234E-14				
Temp*Et_OH	1	-7.43549E-05	8.459122E-06	-8.79	0.000000	0.031864
Temp*Acid	1	-3.193634E-07	0.0001268868	0.00	0.998016	0.000000
Et_OH*Acid	1	5.562052E-05	8.459122E-05	0.66	0.517989	0.000178

Optimum Solution Section

Parameter	Maximum Exponent	Optimum Value
Temp	2	3023
Et_OH	2	-6196
Acid	2	6203

Function at optimum -56.75509
 Number of Function Evaluations 504
 Maximum Functions Evaluations 500

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

Response-Surface Regression Report

Dataset Untitled
 Response tan_δ

Residual Section

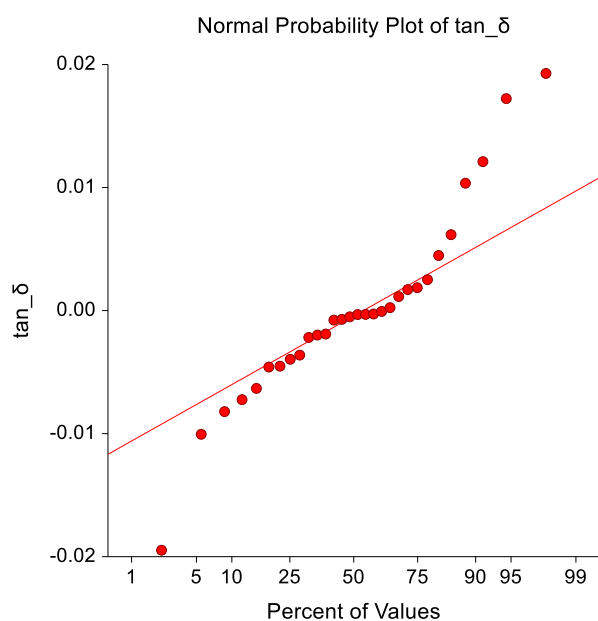
Row	tan_δ	Predicted	Residual
1	0.1927344	0.1934474	-0.0007130181
2	0.191138	0.1930448	-0.001906718
3	0.3802636	0.3699116	0.01035201
4	0.3804822	0.3743145	0.006167713
5	0.1297617	0.1286239	0.001137804
6	0.1326791	0.1282028	0.004476302
7	0.2580693	0.2408454	0.01722392
8	0.2444554	0.2452299	-0.0007745216
9	0.2341146	0.2220106	0.01210401
10	0.2412817	0.2220106	0.01927119
11	0.1953064	0.1934474	0.001858986
12	0.1932833	0.1930448	0.0002385561
13	0.3659542	0.3699116	-0.003957374
14	0.3739896	0.3743145	-0.0003249341
15	0.1241046	0.1286239	-0.004519252
16	0.1276954	0.1282028	-0.0005074464
17	0.2336063	0.2408454	-0.007239091
18	0.2406397	0.2452299	-0.004590173
19	0.2183909	0.2220106	-0.003619659
20	0.2219426	0.2220106	-6.79584E-05
21	0.1959604	0.1934474	0.002512986
22	0.1910539	0.1930448	-0.001990837
23	0.3598579	0.3699116	-0.01005359
24	0.3721307	0.3743145	-0.002183778
25	0.1283463	0.1286239	-0.0002775509
26	0.1278929	0.1282028	-0.0003099014
27	0.2345195	0.2408454	-0.006325827
28	0.2469357	0.2452299	0.001705742
29	0.2025348	0.2220106	-0.0194758
30	0.2137988	0.2220106	-0.008211792

This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).

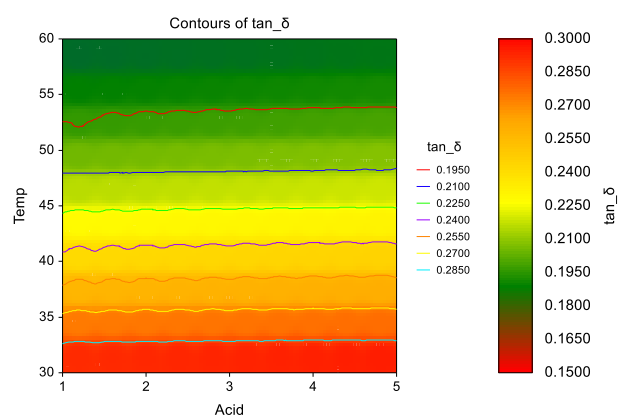
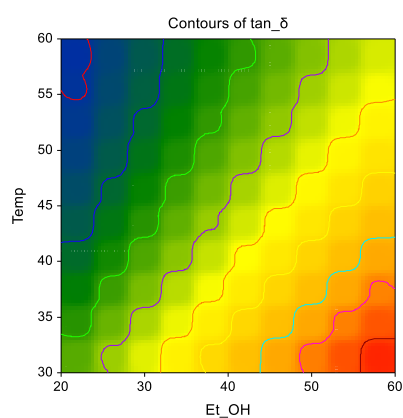
Response-Surface Regression Report

Dataset Untitled
Response tan_δ

Probability Plot



Contour Plots

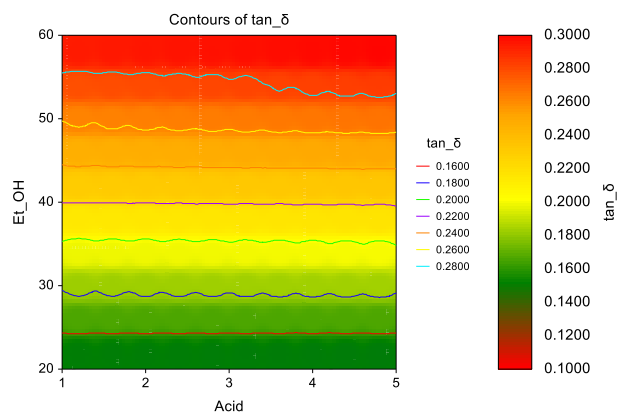


**This report is for evaluation purposes only.
There are 30 days remaining in your free trial (Expires on 7/20/2021).**

Response-Surface Regression Report

Dataset Untitled

Response tan_δ



This report is for evaluation purposes only.
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CORRELATION AMONG THE RESPONSES

Correlation Matrix Report

Dataset Untitled

Pearson Correlation Report

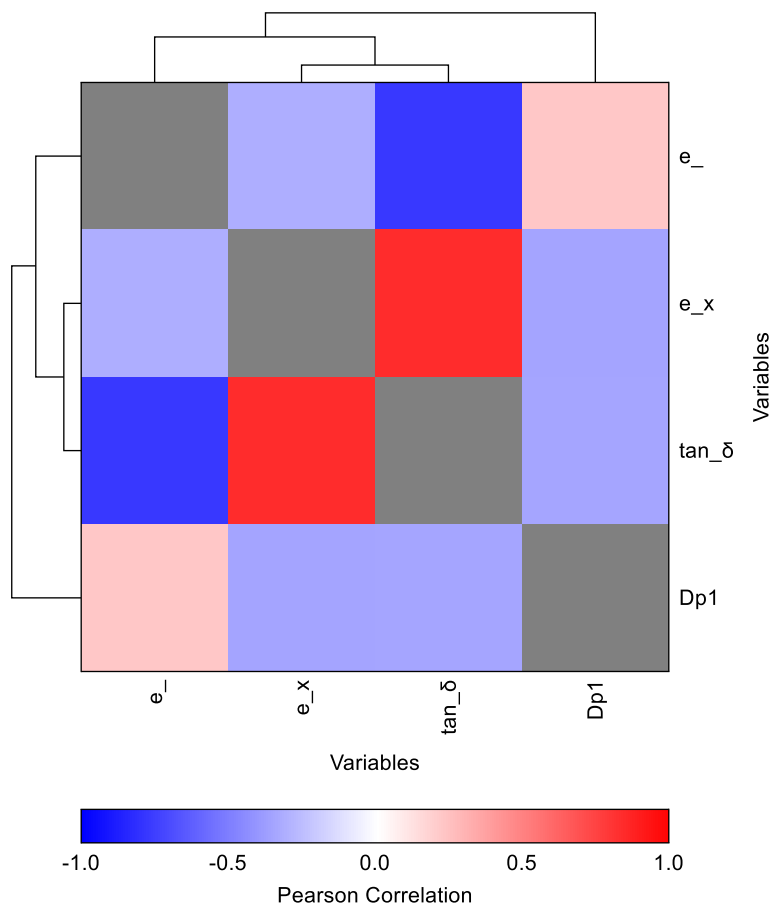
Row-Wise Missing Value Deletion

Variables	e_	e_x	tan_δ	Dp1
e_	1.0000	-0.3162	-0.7805	0.2200
e_x	-0.3162	1.0000	0.8267	-0.3571
tan_δ	-0.7805	0.8267	1.0000	-0.3516
Dp1	0.2200	-0.3571	-0.3516	1.0000

Cronbach's Alpha = -0.2384 Standardized Cronbach's Alpha = -0.8150

Heat Map of the Pearson Correlation Matrix

Heat Map of the Pearson Correlation Matrix



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Correlation Matrix Report

Dataset Untitled

Pearson Eigenvectors Plot(s)

