

# 附錄一

# G value 運算表使用

The screenshot shows a Microsoft Excel spreadsheet titled 'Microsoft Excel - Gtest.xls'. The spreadsheet is organized into several columns and rows. The columns are labeled A through W. The rows are numbered 1 through 59. The spreadsheet contains data for three different models: Probit, Logit, and Weibull. Each model has columns for 'A', 'B', and 'Model Estimates'. A 'G value' column is highlighted in yellow at the bottom of each model's data. Red dashed boxes and numbers (1), (2), and (3) are used to highlight specific data points and model estimates.

## 1. 輸入資料的準備:

將實驗之原始數據，以各種劑量反應模式計算後，求的截距 A，B。

## 2. 資料輸入

(1) 選擇適合的實驗組數(7 組、6 組、5 組)，輸入溶氧、細胞數或生長率以及濃度。

(2) 輸入三種模式的截距 A 與斜率 B。

其他地方皆不需修改

## 3. 輸出結果

經過各函數運算後，各結果皆會輸出在中下方有標示的欄位，三種 G 值在各欄最下方，如(3)所指的地方。選擇 G 值最小的為最佳化模式。

# 附錄二

# Cut-off value 運算表使用

Conc	Initial DO	Final DO	Final cells	Delta DO	µspecific
Control	1.82	10.85	318000	9.03	1.527001
1	57.05	1.18	40300	-1.11	0.404151
2	11.41	1.23	42100	-1.19	0.515999
3	6.52	1.37	45700	-1.33	0.557024
4	1.304	1.03	208800	5.22	1.316663
5	0.98	0.94	294100	7.23	1.487935
6	0.33	1.17	301500	8.24	1.50036
Control	1.09	10.56	342000	9.47	1.56338
7	57.05	1.13	37900	-1.05	0.46345
8	11.41	1.04	42700	-1	0.523074
9	6.52	1.13	46500	-1.09	0.563701
10	1.304	1.37	201400	4.61	1.298621
11	0.98	1.09	315500	7.65	1.523054
12	0.33	1.75	344600	9.08	1.567167
Control	1.15	11.05	313600	9.9	1.520034
13	57.05	1.42	54000	-1.35	0.640467
14	11.41	1.2	31800	-1.16	0.61967
15	6.52	1.03	54500	-0.99	0.645075
16	1.304	1.08	227500	5.39	1.35955
17	0.98	1.05	266400	6.53	1.438474
18	0.33	1.72	305200	8.28	1.506459

Sw	F ratio	cut-off value
0.33	496.61	7.42

DO	FY	GR
7.42	9.494805	7.104977

## 1. 資料輸入

(1) 選擇適合的實驗組數(7 組、6 組、5 組)，輸入溶氧、細胞數或生長率以及濃度。

其他地方皆不需修改

## 2. 輸出結果

經過運算後，各結果皆會輸出在中下方有標示的欄位，三種反應終點中斷值，如(2)所指的地方。

# 附錄三

# Dunnnett's test 運算表使用

Microsoft Excel - NOEC\_DUNNET.XLS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Conc	Initial DO	Final DO	Final cells	Delta DO	μspecific													
2	mg/L	mg/L	mg/L	cells/ml	mg/L	1/d													
3	Control	0.88	10.22	319400	9.64	1.529197													
4	11.5	1.67	0.65	37700	-1.02	0.460605													
5	8.9	1.3	0.98	43500	-0.32	0.532355													
6	5.95	1.3	2.64	44400	1.34	0.542595													
7	2.97	1.55	5.71	96400	4.16	0.930228													
8	2.02	1.77	8.25	219000	6.48	1.341079													
9	1.06	1.78	11	314200	9.22	1.520990													
10	0.08	1.66	12	390000	10.34	1.629048													
11	Control	1.21	9.78	291500	8.57	1.483485													
12	11.5	1.72	0.88	32600	-0.84	0.388131													
13	8.9	1.3	0.86	32100	-0.44	0.395742													
14	5.95	1.36	2.47	30800	1.11	0.359732													
15	2.97	1.29	4.66	89000	3.37	0.890293													
16	2.02	1.63	7.5	235600	5.87	1.377043													
17	1.06	2.07	8.14	288000	6.07	1.478496													
18	0.08	1.66	12	390000	10.34	1.629048													
19	Control	1.38	9.92	282400	8.54	1.467637													
20	11.5	1.45	0.99	45300	-0.46	0.552628													
21	8.9	1.51	0.91	37100	-0.6	0.452783													
22	5.95	1.75	2.94	32000	1.19	0.378843													
23	2.97	1.51	4.46	60400	2.95	0.898097													
24	2.02	1.82	7.22	219900	5.4	1.342561													
25	1.06	2.34	9	284000	6.66	1.472044													
26	0.08	1.66	12	390000	10.34	1.629048													
27	Control	1.167	10.07333	297666.67	8.91667	1.493443													
28	11.5	1.6133	0.84000	36333.33	-0.77333	0.467188													
29	8.9	1.2700	0.91667	37900.00	-0.45333	0.460293													
30	5.95	1.4700	2.68333	35733.33	1.21333	0.427057													
31	2.97	1.4300	4.94333	91933.33	3.49333	0.906206													
32	2.02	1.7400	7.65667	225033.33	5.91667	1.338228													
33	1.06	2.0633	9.20000	295000.00	7.13667	1.490310													
34	0.08	1.6600	12.00000	390000.00	10.34000	1.629048													

Microsoft Excel - NOEC\_DUNNET.XLS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2		Control	11.5	8.9	5.95	2.97	2.02	1.06	0.08	Sum	mean	Row effect							
3	1	9.64	-1.02	-0.32	1.34	4.16	6.48	9.22	10.34	39.84	4.98	0.4838							
4	2	8.57	-0.84	-0.44	1.11	3.37	5.87	6.07	10.34	34.05	4.2563	-0.24							
5	3	8.54	-0.46	-0.6	1.19	2.95	5.4	6.66	10.34	34.02	4.2525	-0.244							
6	Sum	26.75	-2.32	-1.36	3.64	10.48	17.75	21.95	31.02			4.4963							
7	mean	8.9167	-0.773	-0.453333	1.213333	3.4933	5.9167	7.3167	10.34	4.4963									
8	Column	4.4204	-5.27	-4.949583	-3.28292	-1.003	1.4204	2.8204	5.8438										
9	Difference		-9.69	-9.27	-7.70383	-5.423	-3	-1.4	1.4234										
10	d/Sd		-19.55	-18.90888	-15.5455	-10.94	-6.054	-3.229	2.8723										
11	Sum(Yij)	239.31	1.9576	0.656	4.4438	37.365	105.61	166.21	320.75	876.29									
12	c=8	n=3								488									
13	A	R	K	全部總和	C														
14	876.29	488	868.33	107.91	485.1903														
15	SSqE	msq	Sd	(dofy-r)²	(dofz-r)²														
16	5.1566	0.3683	0.4955	2.59	2.97														
17																			
18	LOEC=17.63																		
19										Sum									
20	Eij²	0.0574	0.5335	0.122792	0.127509	0.0335	0.0063	2.0152	2.8962										
21		0.0114	0.03	0.064178	0.018678	0.0136	0.0374	1.0134	1.1886										
22		0.0177	0.3103	0.009425	0.048584	0.0898	0.0745	0.1705	0.7208										
23									4.8056										
24																			
25		df	SSq	msq	Sd														
26	Block	2	2.4572	1.228598															
27	Treatme	6	280.69	46.78134															
28	Error	12	4.8056	0.400468	0.5167														

## 1. 資料輸入

(1) 選擇適合的實驗組數(7 組、6 組、5 組)，輸入溶氧、細胞數或生長率以及濃度。

其他地方皆不需修改

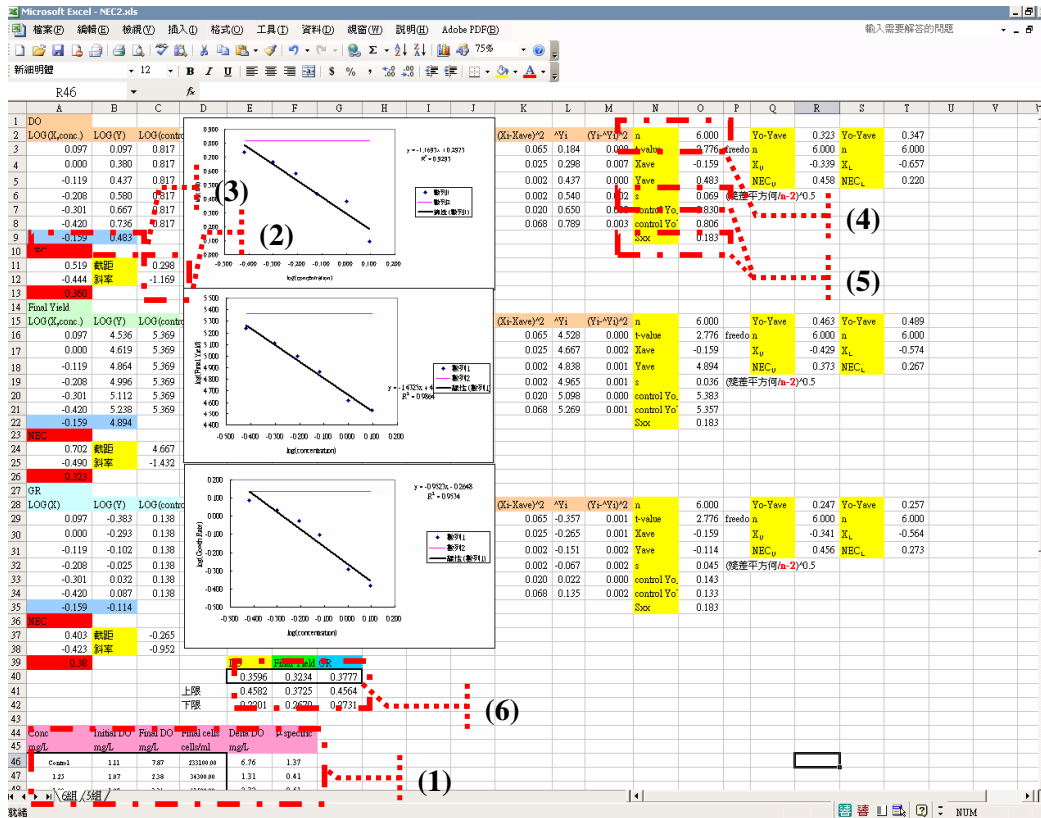
## 2. 輸出結果

最後可得到各個計算參數值。再由(2)中所計算得到的值與統計分析(3)上的值相比較，求得 NOEC。



# 附錄四

# NEC 運算表使用



## 1. 資料輸入

- (1) 選擇適合的實驗組數(6 組、5 組)，輸入溶氧、細胞數或生長率以及濃度。
- (2) 修改最佳斜率及截距
- (3) 修改平均值 Xave、Yave
- (4) n 參予回歸的組數
- (5) s、Sxx 修改成和參予回歸組數相同

其他地方皆不需修改。Final Yield 和 Growth rate 的修改方法相同

## 2. 輸出結果

最後可得到各個反應終點的 NEC 值及其信賴區間，如(6)中所示。

## 附錄五

## NEC 原始數據

Chemicals	NEC( mg/l )	下限	上限	n	P
benzene	11.6558	-	-	4	0.0203
chlorobenzene	3.8826	1.3826	5.8874	6	0.0065
1,2-dichlorobenzene	2.1715	1.6020	2.5091	5	0.0053
1,3-dichlorobenzene	1.1078	0.3895	1.7459	5	0.0065
1,4-dichlorobenzene	1.3816	1.1448	1.6591	5	0.0002
1,2,3-trichlorobenzene	0.6371	0.1375	0.9119	4	0.0231
1,2,4-trichlorobenzene	0.3525	0.2475	0.4479	5	0.0006
1,3,5-trichlorobenzene	1.0083	0.6559	1.2801	5	0.0016
1,2,3,4- Tetrachlorobenzene	0.3085	0.0336	0.5443	4	0.0219
1,2,4,5- Tetrachlorobenzene	0.6757	0.0719	1.1115	4	0.0241
Hexachlorobenzene	0.0991	0.0518	0.1478	5	0.0012
ethylbenzene	0.4252	0.2275	0.6661	6	0.0001
2-chloro-p-xylene	1.4144	0.8803	1.8723	5	0.0016
nitrobenzene	7.6027	5.1959	10.2785	5	0.0003
2-chlorotoluene	8.0615	4.5497	10.0549	5	0.0079
Toluene	12.0163	-	17.5300	3	0.0507
4-chlorotoluene	5.9625	3.6150	7.9343	6	0.0010
2,4-Dichlorotoluene	2.0371	1.0732	2.7584	6	0.0037
2,6-dinitrotoluene	2.7656	1.3449	4.3047	4	0.0022
1,1-Dichloroethane	38.0531	16.8248	43.1334	4	0.0319
1,2- Dichloroethane	112.9434	70.4965	139.8210	5	0.0056
1,1,1- Trichloroethane	27.6522	20.5551	34.3229	5	0.0002
1,1,2- Trichloroethane	74.5262	54.9514	88.2901	5	0.0020
1,1,1,2- Tetrachloroethane	3.7074	2.3187	5.1335	6	0.0002
1,1,2,2- Tetrachloroethane	5.7259	2.3865	8.9456	5	0.0028
Pentachloroethane	4.2840	1.4747	5.7691	4	0.0197
Hexachloroethane	0.1575	0.0744	0.2511	6	0.0005
methylene chloride	10.7729	1.4687	23.3894	6	0.0046
Chloroform	17.5161	9.9881	26.3120	5	0.0003
tetrachloromethane	17.3810	3.2535	25.5218	5	0.0185
1,2-dichloropropane	27.1911	17.7295	38.9073	5	0.0004
1,3-dichloropropane	0.4250	0.0073	2.5811	5	0.0040
1-chlorobutane	27.5419	18.3962	33.5765	5	0.0034
cis-1,2-dichloroethylene	51.8067	37.8609	58.2926	4	0.0134
trans-1,2-dichloroethylene	31.6419	26.5861	34.7818	5	0.0021

Chemicals	NEC( mg/l )	下限	上限	n	P
trichloroethylene	12.4796	7.6066	17.2612	5	0.0007
tetrachloroethylene	3.1125	0.3895	8.1833	5	0.0042
Phenol	3.3377	0.0336	9.7696	5	0.0162
2-Chlorophenol	2.8715	0.1995	7.1475	5	0.0096
4-Chlorophenol	3.1433	0.0209	8.8967	5	0.0201
2,3-Dichlorophenol	0.3660	0.1201	0.7279	5	0.0014
2,4-Dichlorophenol	0.4571	4.10E-05	2.0663	5	0.0245
2,4,6-Trichlorophenol	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	0.0005	2.95E-11	0.0099	5	0.0206
Pentachlorophenol	0.0013	2.66E-05	0.0034	5	0.0161
2-nitrophenol	1.6584	-	3.6035	4	0.0816
3-nitrophenol	2.2754	0.8132	3.8708	5	0.0040
4-nitrophenol	0.0994	0.0334	0.1777	6	0.0009
2,4-dimethylphenol	7.1711	1.1055	12.5561	5	0.0128
2,4-dinitrophenol	0.5040	0.3059	0.6979	6	0.0003
3-chloroaniline	4.7685	1.9798	7.2909	6	0.0267
4-chloroaniline	0.7385	0.2803	1.2242	6	0.0013
2,4-dichloroaniline	2.5354	2.2681	2.7875	4	0.0005
2,5-dichloroaniline	3.0792	1.9814	4.0970	5	0.0012
2,6-dichloroaniline	7.2708	6.0305	8.4592	5	0.0001
3,4-dichloroaniline	1.0424	0.2441	1.7708	4	0.0160
3,5-dichloroaniline	1.8421	0.0602	4.5996	5	0.0133
2,4,5-trichloroaniline	0.4909	0.1948	0.8130	5	0.0020
2,4,6-trichloroaniline	2.2332	0.5449	3.6369	4	0.0150
3,4,5-trichloroaniline	0.7741	0.0920	1.8149	5	0.0074
2,3-dimethylaniline	21.8520	4.4111	36.5732	4	0.0185
3,4-dimethylaniline	3.5297	0.4970	6.5624	5	0.0103
2-bromoaniline	6.9644	1.7558	11.2886	4	0.0150
Formaldehyde	1.0806	0.3030	1.8777	6	0.0033
Acetaldehyde	0.0006	9.37E-09	0.0253	5	0.0079
Propionaldehyde	6.0156	2.7199	9.1574	6	0.0008
Butyraldehyde	1.1622	0.1449	3.3412	6	0.0016
Glutaraldehyde	0.7005	0.2485	1.3399	6	0.0005
2-Pyridinecarboxaldehyde	11.0170	-	-	-	0.1517
3-Pyridinecarboxaldehyde	-	-	-	-	0.2539
4-Pyridinecarboxaldehyde	7.4946	4.9071	9.9011	4	0.0027
2-Hydroxybenaldehyde	0.5508	0.0002	1.8196	4	0.0287

Chemicals	NEC( mg/l )	下限	上限	n	P
3-Hydroxybenaldehyde	25.6960	8.7694	37.9396	4	0.0130
4-Hydroxybenaldehyde	0.3745	0.0092	1.2805	6	0.0088
Acetonitrile	3236.8091	2150.9529	3961.5020	6	0.0029
Chloroacetonitrile	5.5502	-	15.7977	4	0.1074
Dichloroacetonitrile	0.5137	0.0081	1.3590	6	0.0127
Trichloroacetonitrile	0.0070	0.0011	0.0165	6	0.0037
Bromoacetonitrile	0.0417	0.0107	0.0641	5	0.0118
Propionitrile	86.9259	0.5606	174.9184	4	0.0322
3-chloropropionitrile	129.2693	94.7588	150.3652	5	0.0033
Butyronitrile	380.6791	121.9081	525.6287	4	0.0220
Isobutyronitrile	625.7742	5.7546	833.3621	4	0.0414
4-chlorobutyronitrile	323.8133	0.1264	548.7548	5	0.0374
Benzonitrile	12.3921	0.0389	22.6045	5	0.0351
Malonitrile	2.7599	0.2409	6.9053	4	0.0138
1-propanol	2069.2015	1236.9594	2635.5124	5	0.0047
2-propanol	6419.7202	4013.1625	6703.9609	4	0.0189
1-octanol	0.6510	-	-	3	0.1208
Acetone	2623.2638	1310.3244	3671.4770	6	0.0020
2-octanone	24.8233	19.3802	28.1951	5	0.0025
Atrazine	0.0242	3.75E-05	0.0706	5	0.0244
MCPA	1.6183	0.0361	2.6848	4	0.0366
Parathion	0.3051	0.0635	0.5837	5	0.0052
Dichlorvos	0.2062	0.0885	0.3382	5	0.0021
Malathion	1.2518	0.3968	1.9233	4	0.0160
Fenthion	0.4719	0.1171	0.7822	5	0.0090
Benzanthrone	0.0093	0.0052	0.0150	6	0.0001
Phenanthrene	0.0932	0.0610	0.1139	4	0.0074
Fluoranthene	0.0125	0.0102	0.0147	6	0.0000
Anthracene	0.2392	0.1780	0.2963	5	0.0004
Benzo[a]anthracene	0.0007	0.0000	0.0043	6	0.0093
Acridine	0.3234	0.2670	0.3725	6	0.0001
Benzo[b]fluorene	0.0113	0.0022	0.0263	6	0.0010
Dibenzo[b,i]anthracene	0.0432	0.0239	0.0642	6	0.0002
Perylene	0.0112	0.0054	0.0188	6	0.0001
Benzo[b]chrysene	0.0026	0.0003	0.0053	4	0.0147
Napthalene	1.1317	0.6363	1.6058	6	0.0006