

Homework II:

(use MS EXCEL in all tasks, copy each task in separate spreadsheet and solve, solve it)

1. Reproduce the example 3.A on page 103. Find the name of functions that may be use to simplify the example. Find out whether you attain the same results as those listed in the table 3.A.5.
- 2.

(i) Do an F test to see if the difference is statistically significant.

3.17 Table P3.17 gives Schneider and Rabinovitz' data for the isomerization of CH_3NC to CH_3CN .

- (a) Try to fit the data with a simple first- or second-order rate law. How well does it work?
- (b) Try fitting the data to $\text{rate} = k_1[\text{CH}_3\text{NC}]^2/(1 + K_2[\text{CH}_3\text{NC}])$. How well does the equation fit? (*Hint*: You could plot $[\text{CH}_3\text{NC}]/\text{rate}$ vs. $1/[\text{CH}_3\text{NC}]$. However, I find it more accurate to simply program the rate equation in a spreadsheet and use the solver function to find k_1 and K_2 until the rate equation fits all the data.)
- (c) Are the differences statistically significant? Do an F test on the error in the natural logarithm of the rate.

PROBLEMS

Table P3.17 The rate of methyl isocyanide isomerization

Methylisocinide Pressure (mol/liter)	Rate (mol/liter)	Methylisococinide Pressure (mol/liter)	Rate (mol/liter)
10,520	9.8	18.1	0.0047
10,250	9.4	10.1	0.0019
9,880	9.1	8	0.0012
5,580	5.1	7.14	0.0010
4,020	3.5	5.1	0.00062
3,850	3.5	2.2	0.00014
3,610	3.3	1.39	0.000067
3,580	3.2	1.05	0.000039
1,757	1.5	0.95	0.000036
1,349	1.2	0.59	0.000014
1,050	0.85	0.56	0.000012
486	0.39	0.41	0.0000073
309	0.23	0.286	0.0000036
222	0.15	0.272	0.0000035
100	0.05	0.13	0.00000092
80.6	0.04	0.101	0.00000054
59.6	0.027	0.0876	0.00000040
40.8	0.015	0.0725	0.00000029
29.8	0.010		

Source: Data of Schneider and Rabinovitz (1962).

The result (i.e. *.xls files send as *.zip file to teacher via E/mail or better: use Homework Vault).

