

## Homework II:

(use MS EXCEL)

3.17 Table P3.17 gives Schneider and Rabinovitz' data for the isomerization of  $\text{CH}_3\text{NC}$  to  $\text{CH}_3\text{CN}$ .

- Try to fit the data with a simple first- or second-order rate law. How well does it work?
- Try fitting the data to 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.)
- 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)	Methylisocinide 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).