

## Appendix B: Excel 2007 instructions:

### For finding rate coefficients:

- 1) Label the first 3 columns the following: time, # A, and  $\ln [A]$ . You can use arrows on the keyboard to move around on the spreadsheet.
- 2) Each cell has a name starting with the column letter and ending with the row number. For example, **cell B5** has been highlighted in the figure below.

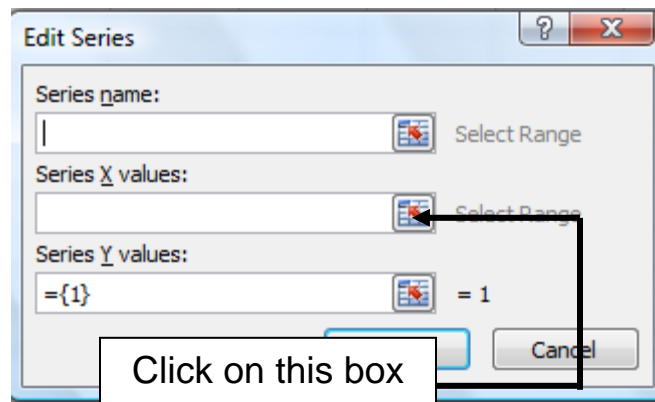
	A	B	C	D	E
1	time	# A	$\ln [A]$		
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

- 3) Type in time data in the first column
- 4) Type in the # of A molecules in the second column
- 5) Determine the  $\ln [A]$  in the third column by typing in the following in **cell C2**: =, type in  $\ln$ , hit an open parenthesis (, click on cell B2, hit a closed parenthesis ), and hit enter. (**You must put in an equal sign in first or it will not calculate.**)
- 6) Click on cell C2 and notice the black box in the lower right-hand corner (**shown in the figure below**). **Double click** on the box and the rest of the column will be calculated or click once on the box and highlight the rest of the column.

	A	B	C	D	E
1	time	# A	ln[A]		
2	0	50	3.912023		
3	11.46	50			
4	21.72	50			
5	33.35	50			
6	43.26	50			
7	54.72	49			
8					
9					
10					

Double click on this box to calculate the rest of the column

- 7) To calculate the ln [A] versus time data, first click on **cell E4**.
- 8) On the top of the screen notice the tabs labeled home, insert, etc. Click on the tab labeled insert.
- 9) A new menu will open on the top and click on scatter.
- 10) Under the scatter pull down menu, select the first option (the graph where the dots are not connected.)
- 11) An empty graph will appear on the spreadsheet and a new menu will be on the top of the screen. Click on **select data.**
- 12) Click on add in the new menu
- 13) Now you can choose the data that you want to graph. Under the **Series X values** click on the box to the right of where you type in data (**refer to the figure below**). It will let you select data from the spreadsheet.



- 14) Highlight only the numbers in the first column and when you are done click on the box to the right (same box as the figure given above).
- 15) Select the **Series Y values** using the same steps as **13 and 14** but for step 13 click on the box next to Series Y values and for step 14 highlight the numbers only in the 3<sup>rd</sup> column.
- 16) Once you are done hit ok and it will bring you back to the original menu and hit ok again.

- 17) Now let's put labels on the chart, under the design tab look for the section labeled chart layouts and click on layout 1 (the 1<sup>st</sup> option).
- 18) Click on chart title and hit the backspace
- 19) Click on the axis title that is located on the x-axis
- 20) Highlight the words and hit backspace. Type in time (sec).
- 21) Click on the axis title that is located on the y-axis and highlight the words and hit backspace.
- 22) Type in  $\ln [A]$
- 23) To get the linear regression line or trendline, click on the chart and click on the tab labeled layout.
- 24) Under the analysis block, click on trendline.
- 25) Click on more trendline options...
- 26) Pick the trend/regression type as linear and on the bottom of the menu click on the box next to display equation on chart.
- 27) Hit close and the equation will be on the chart.
- 28) You need to format the equation by first clicking on the equation on the chart.
- 29) Click on format selection which is under the current selection block.
- 30) Choose the number menu from the left-hand side menu
- 31) Click on scientific under the category menu located in the middle
- 32) Change the decimal places from 2 to 3, by highlighting the number and typing in 3.
- 33) Hit close and record the slope on your tutorial worksheet. To find the other rate coefficients, erase all the numbers and start with step 3.

### **Finding the Activation Energy and Frequency Factor:**

- 1) Label the first 2 columns the following:  $1/T$  and  $\ln k_f$
- 2) Enter the  $1/T$  data in the first column
- 3) Enter the  $\ln k_f$  data in the second column
- 4) Highlight the **numbers only** in the first 2 columns
- 5) Follow directions 8 – 13 from **finding rate coefficients**
- 6) On step 14 - 15 from finding rate coefficients enter  $1/T$  for x and  $\ln k_f$  for y.
- 7) Follow steps 16 – 32 from finding rate coefficients
- 8) Record the slope and y-intercept on your tutorial worksheet.