




Introduction to Excel and Computer Manipulation of Data, Part II

Part II. Plotting Data

Now that you have learned how to enter data and perform calculations on data in Part I, you will learn how to plot your data. Excel supports a number of different types of plots, known as charts in Excel. However, in this exercise you will only work with scatter charts.

Creating a Scatter Chart. Once you have entered the data you want to plot, you can create a chart by highlighting the data that you want to plot and then using the menu option Insert→Chart or by clicking on the Chart icon () to start the Chart Wizard. Notice that your data should be arranged in columns with the data that you want to appear on the x-axis in the first column and the data that you want to appear in the y-axis in the second column. In the Chart Wizard, select the x-y Scatter chart type and the first sub-type, then click on the Next button, see Figure 1.

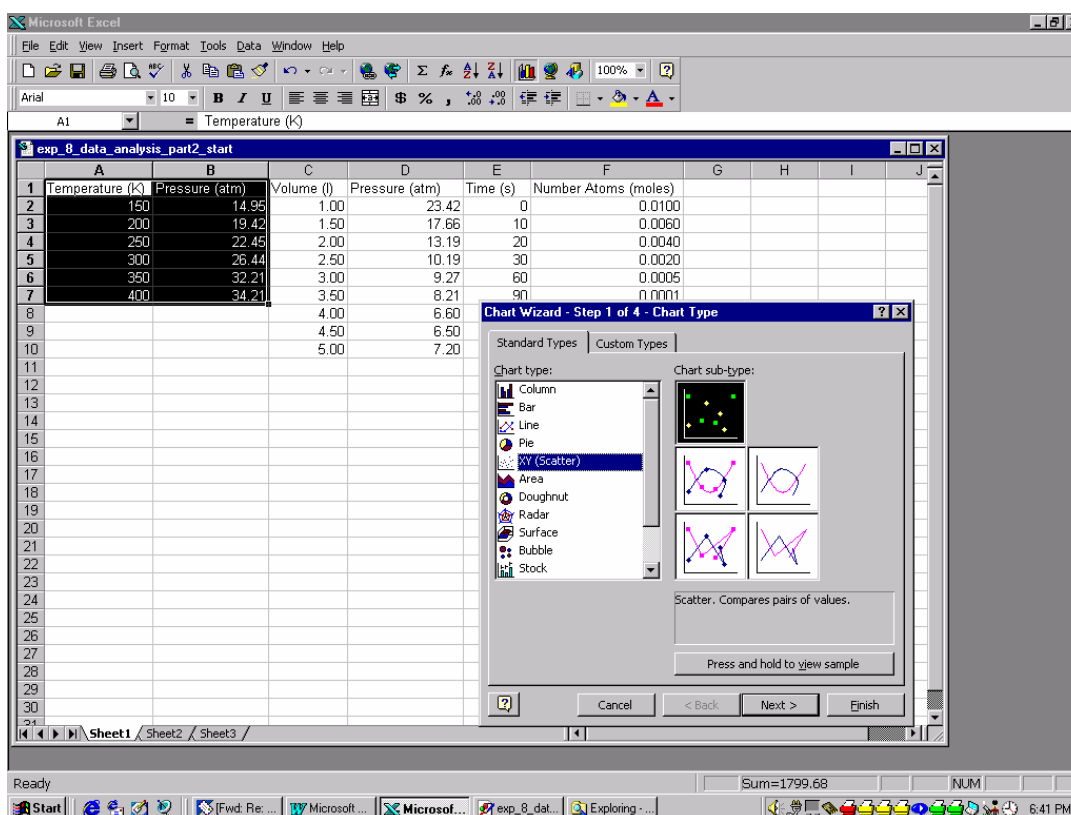


Figure 1. Creating a Scatter Chart from Gas Law Data

Do not enter anything on the next dialog box, just click on the Next button. On the third Chart Wizard screen, enter the title for your chart and the labels for the x and y axes, see Figure 2.

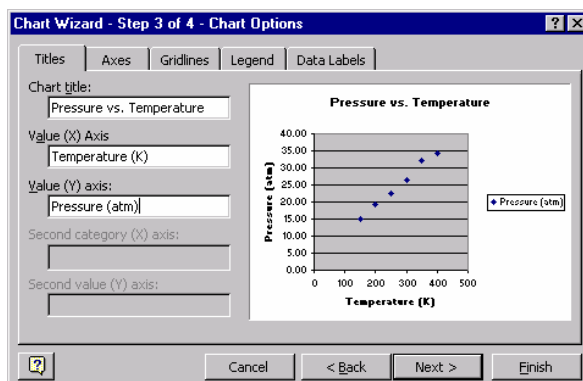


Figure 2. Entering the Chart Title and Axis Labels

On the final Chart Wizard screen, select either to create the chart on the same worksheet that you are currently working in or create the chart on a new worksheet. Excel will then insert your chart into the appropriate worksheet. By default, Excel will specify many options, such as the minimum, maximum, and step values for both axes, formatting for the axis values and labels, etc. You can change these options by double clicking on the item, for example, double click on the x-axis. A dialog box will appear with a number of tabs containing the values that you can change. Experiment with changing these options.

Part II: Exercise

This exercise will give you an opportunity plot experimental data. Using a spreadsheet with the data already entered, you will create three charts. The first two sets of data pertain to the ideal gas laws, which you should be familiar with. The last set of data pertains to nuclear chemistry and decay rates, which you will learn about in Chemistry 155.

Procedure

1. Load Excel by double clicking on the Excel icon on the computer desktop or by selecting it from your program menu.
2. Enter the data and column headers from the table below into a new Excel worksheet. The first set of data represents the pressure of a gas at various temperatures. The second set of data represents the pressure of a gas at various volumes. Assume in both cases that the gas behaves like an ideal gas. The last set of data represents the number of atoms measured in moles and undergoing nuclear decay, over various times.
3. Create an x-y Scatter plot for each of the sets of data (A-B, C-D, and E-F).



	A	B	C	D	E	F
1	Temperature (K)	Pressure (atm)	Volume (l)	Pressure (atm)	Time (s)	Number Atoms (moles)
2	150	14.95	1.00	23.42	0	0.0100
3	200	19.42	1.50	17.66	10	0.0060
4	250	22.45	2.00	13.19	20	0.0040
5	300	26.44	2.50	10.19	30	0.0020
6	350	32.21	3.00	9.27	60	0.0005
7	400	34.21	3.50	8.21	90	0.0001
8			4.00	6.60		
9			4.50	6.50		
10			5.00	7.20		
11						

Table 1. Example data for practicing making plots.

- By right-clicking on any one of the data points on the plot a menu will appear. From the list, choose "Add Trendline" and follow the wizard to choose the type of fit (A-B is linear, C-D is polynomial, and E-F is exponential) and display both the equation for the line and the R^2 value on the chart.

Note: For Chem 142, lab 3, you will need to draw lines on the plots rather than use the Trendline function. To do this, you will use the drawing toolbar to put two straight lines on top of your plotted data. In Excel, click on View→Toolbars→Drawing and the drawing toolbar will appear at the bottom of the Excel window. Click on your plot then on the icon that looks like a straight line. Click on the plot again, and holding down the left mouse button, drag the cursor to make a long line. Then use the "Draw" drop-down menu on the drawing toolbar to rotate your line until it looks to be the best fit on the portion of the plot where your data points increase in y-value. Repeat these steps to add a second line that is the best fit for the second half of your data where the y-values have leveled off. See Figure 3 below.

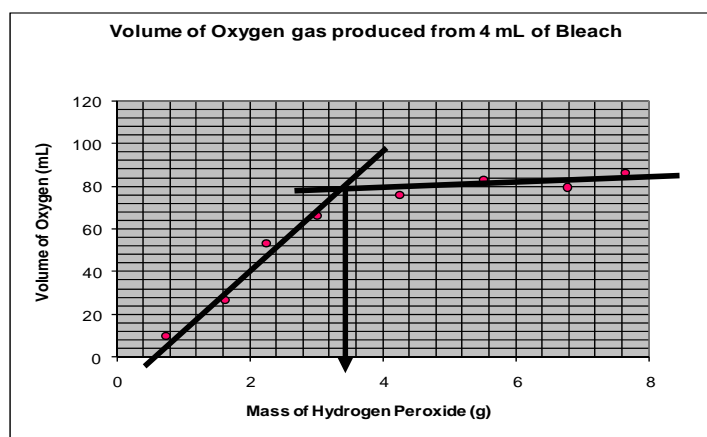


Figure 3. Example of plot with lines drawn on top of data with drawing tool.