

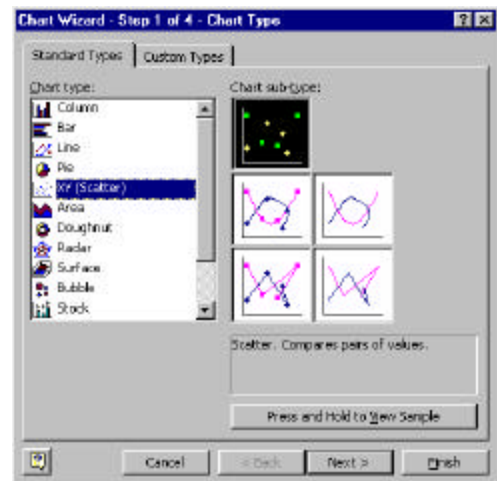
## Simple Instructions for Graphing Data that is Expected to be Linear in EXCEL

This data shown below is a rough format to show you how to plot the graph. You put the data for the X-axis in the first column, and values for the Y-axis in the second column.

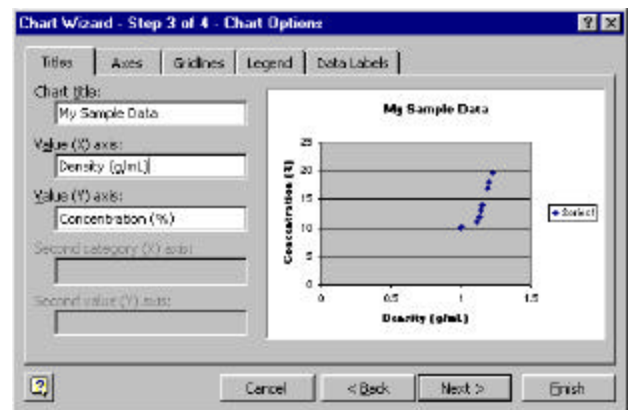
- Select data by first keeping the mouse on the first cell of X-axis and drag it till Y-axis as shown in table.

X-axis	y-axis
DENSITY	% Concentration
.1001	10
1.002	10.2
1.12	11
1.13	12
1.14	13
1.15	14
1.19	17
1.2	18
1.23	19.5

- Go to **INSERT** in the menu bar then select **CHART**.
  - There is also an icon for CHART available for the toolbar. You may have to customize your toolbar to include this icon.
- Select **XY-(Scatter)** plot and then select NEXT. Select the option that does NOT connect the dots.



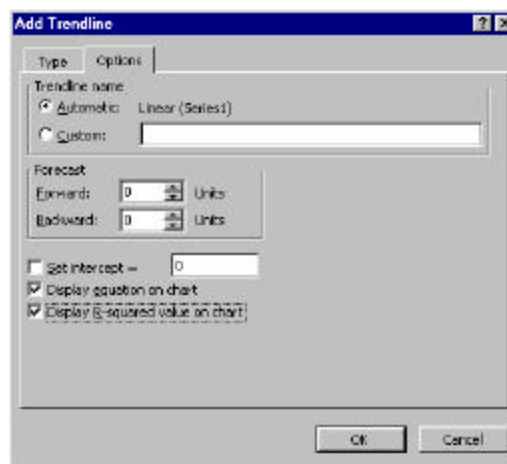
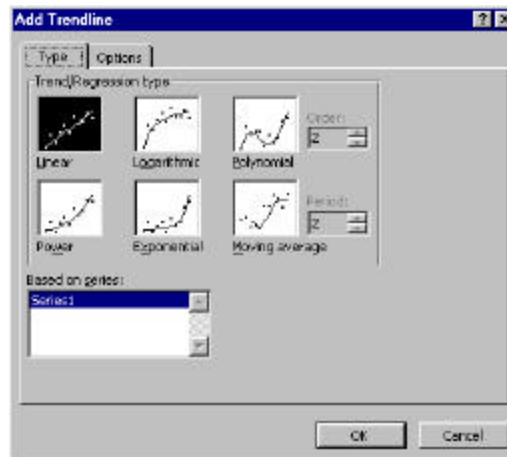
- Fill in the **TITLE** name and label the X- and Y-axes. Once you have labeled everything hit next twice.
  - There are other tabs on this window. You should look around to see if there are other options you would like to include.



- Once you get the graph on the screen, then take your mouse and right click on any of the points on your graph. A dialog box should pop up which will have an option for **ADD TRENDLINE**.

- A new dialog box should open as shown below which possesses **TYPE** and **OPTIONS** tabs. In the **TYPES** tab, select "linear". In the **OPTIONS** tab, select **DISPLAY EQUATION ON CHART** and **DISPLAY R-SQUARED VALUE ON CHART**. Once you have done this, select **OK**.

- Do not force the y-intercept through zero, even if you know that it should go through zero. Use the value of the y-intercept that is calculated by the program to assess how well your line meets your expectations. (If you know that the value is supposed to be zero and it is 100, do you think your line is any good?)



- Your chart should now look like the one shown.

- The equation  $y = 38.976x - 30.157$ , is in the form of a straight line. The y-intercept in this case is -30.159. If this were a plot of real data, it would not be acceptable. The density of the aqueous solution when the concentration is 0% should be the density of pure water at that temperature; which we know is about 1 g/mL, 30.159 g/mL is pretty far off...time to start over.
- The  $R^2$  value is very poor. The closer this value is to 1, the better the line. A value of 0.98 or higher is expected.

