

LAB: IONIZATION ENERGY & ELECTRONEGATIVITY

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, and 7) Procedures (no observations section is needed)

For this lab, two excel graphs will be made using ionization energy and electronegativity data that is given below. This data will be used to graph atomic number vs. ionization energy and atomic number vs electronegativity.

No formal report necessary.

Questions on the last page need to be printed out. You will hand in these questions and the two graphs one week after the completion of the lab.

Ionization Energy and Electronegativity are two properties of an atom that determine how well the atom's valence electrons can be moved into or out of an atom.

Students, you need to place the following chart into your data section and fill in the missing information before coming to class.

Name	Symbol	Atomic #	Ionization Energy (pm)	Electronegativity (pm)
Hydrogen			13.6	2.1
Helium			24.6	0
Lithium			5.4	1
Beryllium			9.3	1.5
Boron			8.3	2
Carbon			11.3	2.5
Nitrogen			14.3	3
Oxygen			13.6	3.5
Fluorine			17.4	4
Neon			21.6	0
Sodium			5.1	0.9
Magnesium			7.6	1.2
Aluminum			6	1.5
Silicon			8.2	1.8
Phosphorus			10.5	2.1
Sulfur			10.4	2.5
Chlorine			13	3
Argon			15.8	0

Table 6.2

Questions on the last page need to be printed out. You will hand in these questions and the two graphs one week after the completion of the lab.

The following are instructions on how to find Microsoft Excel on the Science Room Computers.

1. Click on the start icon in the bottom left corner.
2. Open All Programs
3. Open the Microsoft Office 2007 folder and then open Microsoft Excel
4. Once Excel is open, make sure Excel Workbook is highlighted and then click open

Once Microsoft excel is open, label:

Column A: Name, Column B: Symbol, Column C: Atomic #, and Column D: Ionization Energy

Then enter in the information from Table 6.2 that you entered in your lab notebooks.

After the table of information has been completed it is necessary to highlight all of the data and then click on Insert and choose Scatter plot at the top of the page. In the top left of the icon bar, select Scatter Plot with Markers. Remove all of the series except for Ionization Energy. In the middle of the icon bar, select Chart Layout #1. Fix the titles and axes using the desired information from your prelab. Choose the Move Chart icon at the end of the toolbar. Move to New Sheet. Print out the graph (one copy for each group member). Add your name, period, and group number to the graph. Connect the points as described in the prelab. Add the specific information described in the prelab. Repeat these directions using the Electronegativity data (you will have an additional graph for this data, giving you a total of two graphs for the lab). Answer the 6 questions using your created graphs.

The following procedures are for Microsoft Office Version 2003 or earlier.

Once Microsoft excel is open, label:

Column A: Name, Column B: Symbol, Column C: Atomic #, and Column D: Ionization Energy

Then enter in the information from Table 6.2 that you entered in your lab notebooks.

After the table of information has been completed it is necessary to click on the “Chart Wizard icon” in the upper right hand corner of the program. This program will assist you in creating a graph of your data. Under Chart Type select XY Scatter Plot and then Next in the lower right hand corner. Under Data Range, select the icon to the right (Up Arrow). Once you are now back in excel, select all of the data, and hit enter. Select the Series Tab at the top. Under the name section type: Ionization Energy. Under the X Axis select the icon and then highlight only the atomic number column in excel, then hit enter. Under the Y Axis select the icon and then highlight only the atomic radii column in excel, then hit enter. Remove all of the series except for Ionization Energy. Select the Next Tab at the bottom. Label the X and Y axis in the space provided. Select the Data Label Tab at the top and then select the Show Label box radio dial. Select the Next Tab at the bottom. Select Place chart as NEW SHEET and then select FINISH. Print out the graph (one copy for each group member). Add your name, period, and group number to the graph. Connect the points as described in the prelab. Add the specific information described in the prelab. Repeat these directions using the Electronegativity data (you will have an additional graph for this data, giving you a total of two graphs for the lab). Answer the 6 questions using your created graphs.

FOR ALL VERSIONS OF MICROSOFT EXCEL: (YOUR PRINTED GRAPH)

Connect the points of the elements in the second period (atomic # 3-9). Do the same for the elements in the third period (atomic # 11-17). At each point, write only the chemical symbols next to the atomic numbers.

Name _____

Date _____

Period _____

Lab Group # _____

Lab: IONIZATION ENERGY & ELECTRONEGATIVITY

QUESTIONS: (Answer in complete sentences)

1. What changes do you observe between the two graphs (be very specific)?
2. Define ionization energy. Which element on your graph would have the highest IE value?
3. Define electronegativity. What element on your graph would have the highest Electronegativity value?
4. Which elements moved the most as you changed the Y-axis (be specific)? _____
5. What type of elements are these? _____
6. Why would these elements have the highest reading for ionization energy and the lowest reading for electronegativity? Be specific.