

LAB: ATOMIC RADII

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:

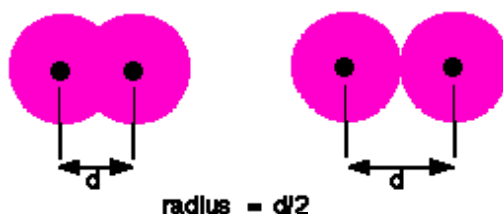
1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, and 7) Procedures (no observations section is needed)

For this lab, an excel graph will be made using atomic radii data that is given below. This data will be used to graph atomic radius vs. atomic number.

No formal report necessary.

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

Unlike a ball, an atom doesn't have a fixed radius. Therefore, the radius cannot be directly measured. The radius of an atom can only be found by measuring the distance between the nuclei of two touching atoms, and then halving that distance.



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 #	Atomic Radii (pm)
Hydrogen			30
Helium			DO NOT FILL IN LEAVE BLANK
Lithium			156
Beryllium			113
Boron			83
Carbon			77
Nitrogen			70
Oxygen			66
Fluorine			62
Neon			DO NOT FILL IN LEAVE BLANK
Sodium			191
Magnesium			160
Aluminum			143
Silicon			109
Phosphorus			109
Sulfur			105
Chlorine			102
Argon			DO NOT FILL IN LEAVE BLANK

Table 6.1

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: Atomic Radii.

Then enter in the information from Table 6.1 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 Atomic Radii Trend. 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. Answer the 6 questions using your created graph.

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: Atomic Radii.

Then enter in the information from Table 6.1 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: Atomic Radii Trend. 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 Atomic Radii Trend. 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. Answer the 6 questions using your created graph.

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 valence electron configuration for the atom and label the chemical symbol next to each atomic number to assist you.

Questions on the next page need to be printed out. You will hand in these questions and the copy of your graph one week after the completion of the lab.

Name_____

Date_____

Period_____

Lab Group #_____

Lab: ATOMIC RADII**QUESTIONS: (Answer in complete sentences)**

1. Describe the general trend of the atomic radii of the elements in the second period.
2. Does the same trend occur in the third period?
3. Explain, in terms of the modern atomic model, why the radii in the second period (atomic # 3-9) display this trend.
4. Explain why there is a change from atomic numbers 9 & 11. (Be specific)
5. Explain the trend indicated by atomic numbers 1, 3, & 11. (Be specific)
6. Based on the information in your graph, predict the atomic radii for atomic number 10. Is it higher or lower than Fluorine's? Using a reference, research the actual value. Is your prediction right?