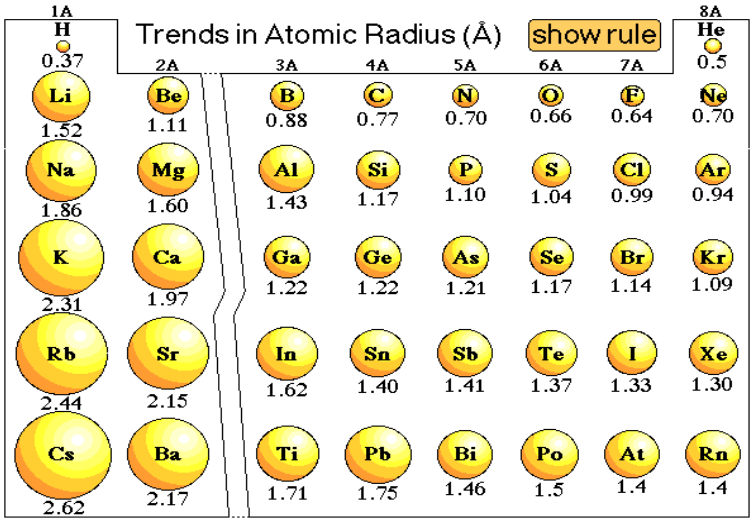
Periodic Trends Lab

Background: The Periodic Table is an organizational tool used by scientists. By putting the elements in order of their atomic number many different trends are shown. Two such trends are atomic radius and electronegativity. The **atomic radius** is a physical property which measures of the size of an element's atoms. **Electronegativity** is a chemical property that describes the ability of an atom to attract electrons towards itself. It often predicts the reactivity of elements.

Purpose: To identify the trends for atomic radius and electronegativity in the periodic table by graphically depicting them.

Pre-lab:

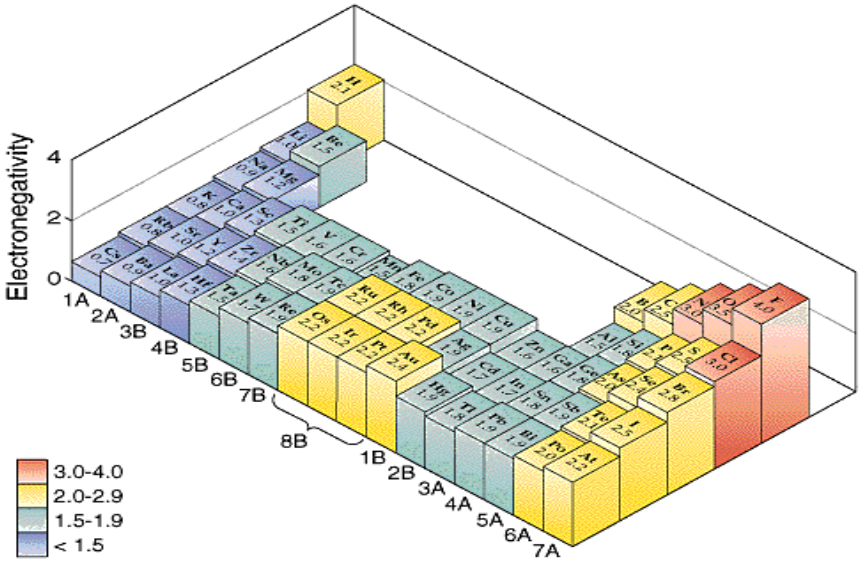


1. Restate the purpose in your own words.
2. Explore the image to the left.

a. What appears to be the trend in atomic radius as you move from left to right in a row?

b. What appears to be the trend in atomic radius as you move down a column?

3. Explore the image below.
   a. What appears to be the trend in electronegativity as you move from left to right in a row?
   b. What appears to be the trend in electronegativity as you move down a column?



Procedure:

A. Use the graph of atomic radius vs. atomic number.

1. Place an asterisks (*) on the point that is for the first element of each period.
2. Put a square around the point that is the last element for each period.
3. Highlight/color the part of the graph that depicts each period a different color.
4. Color the periods of your mini periodic table the correct corresponding colors. Use glue stick to attach mini periodic table onto your graph.

B. Use the graph of electronegativity vs. atomic number.

1. Place an asterisks (*) on the point that is for the first element of each period.
2. Put a square around the point that is the last element for each period.
3. Highlight/color the part of the graph that depicts each period a different color.
4. Color the periods of your mini periodic table the correct corresponding colors. Use glue stick to attach mini periodic table onto your graph.

Analysis:

1. Using the **Atomic Radius** vs. Atomic Number Graph answer the following questions.
   a) What pattern do you see in the second period that is repeated in the third period?
   b) How does this graph agree with your observations of atomic radius made earlier?
   c) Are there any exceptions to the pattern? (Yes or No)
   d) Is the pattern of atomic radius absolute or general (always true or generally true)? Explain.

2. Using the **Electronegativity** vs. Atomic Number Graph answer the following questions.
   a) What pattern do you see in the second period that is repeated in the third period?
   b) How does this graph agree with your observations of electronegativity made earlier?
   c) Are there any exceptions to the pattern? (Yes or No)
   d) Is the pattern of electronegative absolute or general (always true or generally true)? Explain.

3. Consider how both of the properties that you have examined show **periodicity** (trends).

	Increase	Decrease	No change
general trend for atomic radius as you move from left to right on the PT.			
general trend for atomic radius as you move from top to bottom on the PT.			
general trend for electronegativity as you move from left to right on the PT			
general trend for electronegativity as you move from top to bottom on the PT.			

4. Look at the electronegativity graph.
   a) List the elements with “zero” electronegativity values.
   b) Where do all of these elements reside on the periodic table?
   c) These elements actually have no data, but were graphed as “zero” to simplify the situation. Why do you think they don’t have electronegativity data?