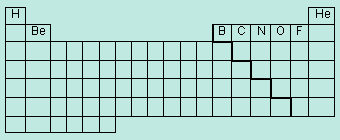
**Part A**: You have been asked to summarize the periodic trends in a group and in a period for the following properties:

* atomic radius;
* ionization energy; and
* electronegativity.



Using the terms ***increasing* or *decreasing***, fill in the blanks for each of the following statements which correctly reflects the general trend of the respective property across a period and in a group/family using :

1. Atomic radii ***decreasing*** going left to right in a period across the Periodic Table.
2. Atomic radii ***increasing*** going top to bottom in a group/family in the Periodic Table.
3. Ionization energies ***increasing*** going left to right in a period across the Periodic Table.
4. Ionization energies ***decreasing*** going top to bottom in a group/family in the Periodic Table.
5. Electronegativities ***increasing*** going left to right in a period across the Periodic Table.
6. Electronegativities ***decreasing*** going top to bottom in a group/family in the Periodic Table.

**Part B:** Answer the following questions using proper grammar and full sentences:

1. Summarize the metallic and non-metallic characteristics of the periodic properties.

Metallic character is the level of reactivity of a metal, metals with lower ionization energy and lower electronegativity have a greater magnitude of metallic character. Non-metallic character is the inverse of metallic character, where it is the ability to accept electrons during chemical reactions, having high ionization energy and high electronegativity.

1. Explain the atomic radius trend in a group and in a period.

In a period, as the atomic number increases from left to right, the atomic radius decreases. In a group, as the atomic number increases from top to bottom, the atomic radius also increases.

1. Explain the relationship between atomic radius and ionization energy trends in a group and in a period.

The relationship between atomic radius and ionization is an inverse/opposite relationship. In a period, as the atomic number increases from left to right, the atomic radius decreases and the ionization energy increases. In a group, as the atomic number increases from top to bottom, the atomic radius increases and the ionization energy decreases.

1. Compare the relative energies between a 2s orbital and a 4s orbital. What clues are there to verify this comparison?

The ionization energy of a 2s orbital is greater than the ionization energy of a 4s orbital, as the atomic number of a group increases from top to bottom. Also taking into account the 2s orbital has 4 orbitals in the shell whereas the 4s orbital has 16.

1. Suggest a reason why there is not a significant change in ionization energies when electrons are removed from the same electron's shell.

When electrons are removed from the shell, it is to change the properties and achieve a certain state, to form a bond and achieve a bonded result. Hence the ionization energies do not vary in a significant magnitude, because the electrons lost and gained also has an energy transfer because of the law of conservation of energy,

1. Which group would not have data concerning electronegativity? In terms of their electrons and their orbitals, suggest a reason.

Noble gases, they are the perfect octet, no valence electrons, and electronegativity is the tendency for an atom to attract electrons, but the noble gasses have perfect full orbital shells hency they have no data concerning electronegativity.

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