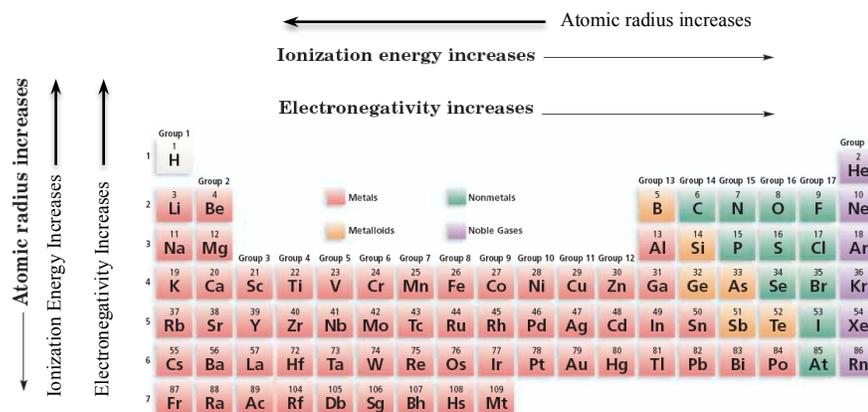


TREND Summary:



Answer the following questions:

- Circle the element in each pair that has the higher ionization energy?
 a) K or Li b) He or Rn c) Ne or Li d) Fr or He
(These elements are in the far corners of the table. Use both the across and down trends.)
- Circle the element of each pair that would have the greater electronegativity:
 a) K or Ca b) Li or N c) S or Se d) F or I e) Li or F
- Circle the atom of each pair that would have the smaller radius.
 a) Na or Cs b) Na or Cl c) Na or Al d) F or I
- As a comparison, a few days ago we discussed how sizes change when one goes from a neutral atom to an ion. Circle the one of each pair that would have a smaller radius:
(Be aware: The number of protons are not changing. Electrons are either lost or gained.)
 a) F or F⁻ b) Na or Na⁺ c) Ca or Ca²⁺ d) N or N³⁻
- Hydrogen is normally shown in column I with the alkali metals on the periodic table. However, hydrogen's properties are not similar to the properties of metals.
 Its radius is too _____. Its ionization energy is too _____. Its electronegativity is too _____.
- In general, which elements tend to have lower electronegativities? **metals or nonmetals?** _____
- In general, which elements tend to have higher electronegativities? **metals or nonmetals?** _____
- Compounds often form between metals and nonmetals. When forming these compounds one element will lose electrons (form positive ions) and the other will gain electrons due to their differences in electronegativity.
 - The metals _____ electrons and form _____ ions because they _____ attract their valence electrons.
 - The nonmetals _____ electrons and form _____ ions because they _____ attract electrons.

**** Forming these compounds is very favorable because the ions formed are very strongly attracted to each other (because of strong electromagnetic attractions.)**
- Within a compound, what is the most common charge for an ion in the alkali family? _____
- Within a compound, what is the most common charge for an ion in the halogen family? _____

- 11) Within a compound, what is the most common charge for an ion in the alkaline earth family? _____
- 12) Within a compound, what is the most common charge for an ion in group V? _____
- 13) Sometimes, **two nonmetals** will react to form a compound. Since the electronegativities of both nonmetals is high, the elements both attract electrons strongly and so they must share electrons. However, the elements do not always share electrons equally.
- For example, when carbon and oxygen bond together by sharing electrons, which atom would attract the electrons more strongly—C or O? _____
 - When phosphorus bonds with chlorine, which attracts electrons more strongly—P or Cl? _____
- 14) Why don't noble gases have electronegativity values? _____
- 15) What three elements have the highest electronegativities? _____

Review of Trends—definitions and explanations

- 16) The valence electrons in an atom with a high effective nuclear charge are (**weakly, strongly**) attracted to the nucleus.
- 17) The shielding electrons are the (**inner core, outer valence**) electrons.
- 18) Calculate the effective nuclear charge for the following elements: (Show calculation.)
- Ca _____
 - S _____
- 19) The larger the atomic radius, the (**larger, smaller**) the size of the atom.
- 20) The size or radius of an atom mainly depends on the space (**the nucleus takes up, the electrons take up**)
- 21) The higher the ionization energy, the (**harder, easier**) it is to remove an electron from an atom.
- 22) The higher the electronegativity of an atom, the (**more, less**) the atom attracts electrons to itself.
- 23) Why do the radii of atoms increase as one goes down a family?
(*Make sure to discuss both the effective nuclear charge and the number of main energy levels.*)
- 24) Why do the radii of atoms decrease as one goes across to the right in a period?
(*Make sure to discuss both the effective nuclear charge and the number of main energy levels.*)
- 25) Why do smaller atoms have higher ionization energies?
- 26) Why do smaller atoms have higher electronegativities?