Even More Periodic Table Trends

Name: _____KEY_____

1.) Circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius: Cu K Ni Br

a.) Explain why you made these choices:

Answer - All of the elements are in the same period. The trend in atomic radius as you go across a period is DECREASING. Therefore, the element on the far left (K) is the largest, and the element on the far right (Br) is the smallest.

2.) Circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy: Cu K Ni Br

a.) Explain why you made these choices:

Answer - All of the elements are in the same period. The trend in ionization energy as you go across a period is INCREASING. Therefore, the element on the far left (K) has the lowest ionization energy, and the element on the far right (Br) has the highest ionization energy.

3.) Circle the element with the highest electronegativity and put a square around the element with the lowest electronegativity: Cu K Ni Br

a.) Explain why you made these choices:

Answer - All of the elements are in the same period. The trend in electronegativity as you go across a period is INCREASING. Therefore, the element on the far left (K) has the lowest electronegativity, and the element on the far right (Br) has the highest electronegativity.

4.) For each of the following groups: Circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius:

a.) O C Be Ne
b.) Na Rb Fr H
c.) Pb C Sn Si
d.) Au W S Fr Ne Zn

6.) For each of the following groups: Circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy:

a.) O C Be Ne
b.) Na Rb Fr H
c.) Pb C Sn Si
d.) Au W S Fr Ne Zn

7.) For each of the following groups: Circle the element with the highest electronegativity and put a square around the element with the lowest electronegativity:

a.) O C Be Ne
b.) Na Rb Fr H
c.) Pb C Sn Si
d.) Au W S Fr Ne Zn

8.) Circle the ions that will have a radius larger than the radius of their neutral parent atom and put a square around the ions that will have a radius smaller than the radius of their neutral parent atom:

Na^{+} Sr^{+2} P^{-3} Cr^{+3} O^{-2} C^{-4} C^{+4} Ag^{+} Br^{-}

a.) Explain why you made these choices:

Answer - Cations (+ charge) are smaller than their parent atom because they have LOST electrons. Anions (- charge) are larger than their parent atom because they have GAINED electrons.

9.) For each of the following groups, circle the ion with the largest ionic radius:

a.) Cu^{+} Cu^{+2} b.) Cr^{+3} Cr^{+2} Cr^{+6} Cr^{+4} c.) O^{-2} O^{-}

10.) Rank the following elements in order of increasing atomic radius: Carbon, Aluminium, Oxygen, Potassium

Answer - Oxygen < Carbon < Aluminium < Potassium

11.) Rank the following elements in order of increasing electronegativity: Sulphur, Oxygen, Fluorine, Aluminium

Answer - Aluminium < Sulphur < Oxygen < Fluorine

12.) Rank the following elements in order of decreasing ionization energy: Lithium, Calcium, Barium, Nitrogen

Answer – Nitrogen, Lithium, Calcium, Barium

13.) What is the difference between ionization energy and electronegativity?

Answer - Ionization energy is the energy required to remove an electron. Electronegativity is the ability of an atom to gain an electron.