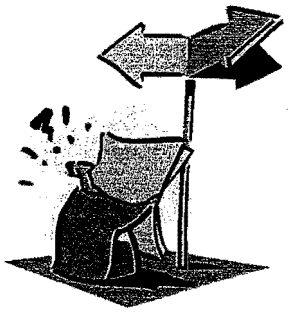
Name : Colton Kreischer

Periodic Trends



1) Ionization energy *increases / decreases* (circle one) as you go across a period and *increases / decreases* (circle one) as you go down a family. Explain why this happens.

Ionization energy increases as you go across a period because the size of the atom decreases as you go right a period due to the new protons attracting the electrons more and making it more difficult to remove the outermost electrons. It decreases as you go down a family, however, because a new valence shell is added, increasing the atomic size and distance between the outermost electrons and protons.

2) Positive ions are *larger / smaller* than the parent atom, whereas negative ions are *larger / smaller* than the parent atom. Explain why this happens.

Positive ions are smaller and negative ions are larger, because both have the same number of protons but positive ions have more electrons and negative ions have less electrons. When there are more electrons (+ ion) the bond between the electrons and protons are tighter, making the atom smaller, while less electrons (- ion) cause a weaker and hence larger bond between the electrons and protons, making the atom larger.

3) Atom size *increases / decreases* (circle one) as you go across a period and *increases / decreases* (circle one) as you go down a family. Explain why this happens.

Atomic size decreases as you go across a period and increases as you go down a family, because as you go over a period the amount of protons increases, causing a tighter bond between the protons and electrons and hence smaller atom, but when you go down a family a new valence shell is introduced, which places the outermost electrons further away from the protons, creating a larger atom.

4) All elements in a *family / period* have the same outer electron configuration. All halogens *lose / gain* 1 (insert number) electron(s) so that the valence shell is completed.

5) Which periodic trend do you feel was most important in development of your periodic table? Justify your position.

I think the most important periodic trend in making our periodic table was that all elements in a period have the same outer electron configuration, because it is the only way that we knew to put the second element at the far right

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6) If you could start over, would you chose a different way to set up your periodic table, and why?

No, I would not choose a different system to apply to my periodic table because the one I had arranged grouped the most similar patterns together.

7) Circle the following element that would have the smallest radius: K, Ra, Kr, Mn

The element with the smallest radius would then also have a *high / low* ionization energy because Krypton, because it is furthest to the right and above the rest of the elements so it must have the sm

8) Name the group of elements in the periodic table that has the following outer electron configuration:

s^2 Noble Gasses

s^2p^5 Halogens

Any d orbital Transition metals

9) The first 3 ionization energies of an element are as follows (kJ/mol): $IE_1 = 403$, $IE_2 = 2632$, $IE_3 = 3859$. What is the charge on the most common ion of this element? -1 How many valence electrons does this element have? 1 Which of the following 3 elements could this unknown be? Ga Rb or Ba

10) Circle the larger of the following sets of atoms or atoms/ions.

Na / Na^{+1} Na / P Na / Ba K^{+1} / Ga^{+3} F / F^{-1} F^{-1} / Ne

11) Which element of the following (Na, Si, Cl, Cs) has:

the highest 1st ionization energy? Cl

the lowest 1st ionization energy? Cs

the smallest atomic radius? Cl

the largest atomic radius? Cs

12) Circle the more electronegative element in each pair:

Calcium / gallium lithium / oxygen chlorine / sulfur bromine / arsenic