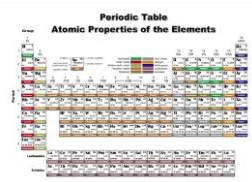
Name:_____ Date:_____ Class Notes

Chemistry



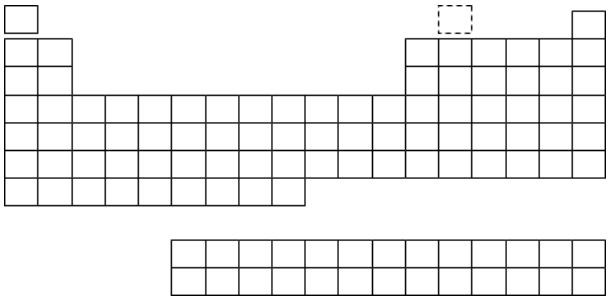
Periodic Trends

Periodic trends are the tendencies of certain elemental properties to **increase** or **decrease** as you progress along a row or column on the periodic table.

Metal, Semi-metal and Non-metal

The elements on the left of the periodic table tend to be metals and those to the right tend to be non-metals. The **semi-metals** are boron, silicon, germanium, arsenic, antimony, tellurium, polonium and astatine. The semi-metals, also known as **metalloids**, are between the metals and the non-metals. To the left of the metalloids are the metals and to the right are the non-metals. Notice that most of the elements are metals.

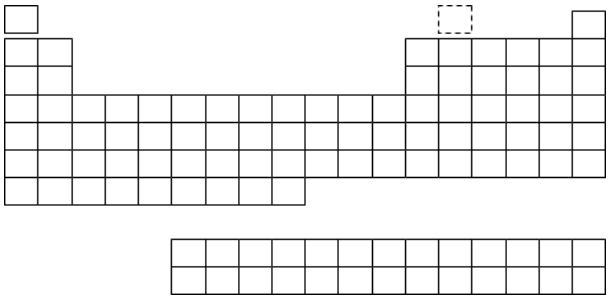
Whether polonium and astatine are metalloids is disputed by many, but for our purposes we will include both of these elements as metalloids.



Atomic Radius

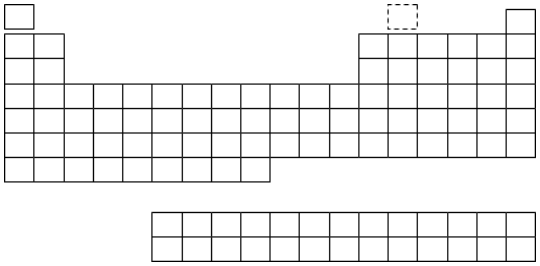
The atomic radius is described as one half the distance between the nuclei of two atoms of the same element. The atomic radii of the elements **decreases** as you go left to right on the periodic table and increases as you go down the periodic table.

The reason for the decrease as you move along a periodic is the increased **attraction** between the protons in the nucleus and the electrons in the electron cloud. But, as you go down a column you increase in **energy levels** as well and the distance from the nucleus increases making the atom larger.



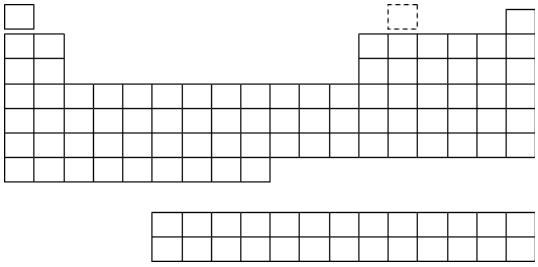
Ionization Energies

Ionization energy is the minimum amount of energy required to **remove** one electron from an atom and increases as you move left to right on the periodic table. The less metallic the element the less likely it will give up an electron therefore you need more energy to remove an electron. The more metallic the element the more likely the element will give up an electron until it reaches a noble gas valence. Once an atom reaches its valence the ionization increases considerably.



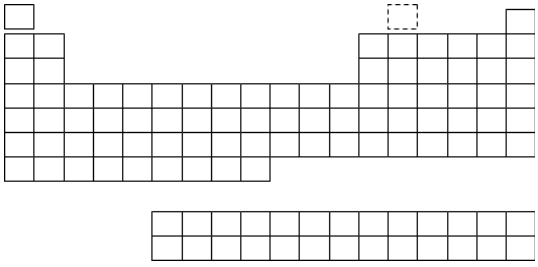
Electron Affinity

Electron affinity is the **energy released** (exothermic) when **adding** an electron to an atom, in other words the likelihood of an atom becoming an anion. Non-metals are more likely to become anions than metals. Electron affinity tends to **increase** as you move left to right on the periodic table because more energy is released.



Electronegativity

Electronegativity is the **measure of the ability** of an atom to **attract** electrons. Electronegativity is a mostly qualitative property based on an atoms electron configuration and fulfilling the octet rule. In order to try and quantify this trend scientists have come up with different values, but the most used scale is the **Pauling scale** named after the chemist Linus Pauling. The noble gases have a full octet and no need to attract electrons and the inner transition elements don't follow trends thus there are no electronegative values for these elements.



"It's what you learn after you know it all that counts."
- John Wooden