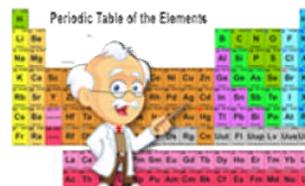


Name: _____ Date: _____
Chemistry

Class Notes

Periodic Table



The periodic table is one of the greatest scientific discoveries of all time. It is third only to the scientific method and the discovery of the microscope. So, it is imperative that you learn the secrets of the periodic table and master how to use it.

Secret #1 the Atomic Number

The atomic is the number of protons in the nucleus of an atom. It is the number of protons that determines the element. The atomic number of hydrogen is "1" and hydrogen has only one proton. The elements are arranged in the periodic table according to the atomic number.

Secret #2 the Modern Periodic Law

The periodic law first presented by Dmitri Mendeleev and then modified by **Henry Moseley**, states that the physical and chemical properties of the elements are periodic functions of the atomic number. This means that there is a repeating pattern in the order of the elements.

Secret #3 the Periods and Families

The seven periods (rows) of the periodic table represent the seven energy levels that the electrons occupy. The eight families (columns) represent the orbital positions of the valence electrons of the elements.

Secret #4 Electron Configuration

The periodic table also accounts for the electron configuration of an electron. The first two families represent the "s" orbitals and the next six families represent the "p" orbitals. It is imperative that you take the time to understand how to write an electron configuration especially for valence electrons.

Secret #5 Valence Electrons

Valence electrons are the electrons occupying the highest energy levels. It is important to master this concept because the valence electrons are the electrons involved in bonding. You determine the valence electrons by counting the "s" and "p" electrons in that period. You can determine that fluorine has seven valence electrons by going to the second period and count over seven times. How many bonds that fluorine will form is determined by whether fluorine will gain or lose electrons.

Secret #6 the Octet Rule

The octet rule states that atoms tend to gain or lose electrons in order to obtain a noble gas configuration. A noble gas configuration is the most stable situation and nature tends toward stability.

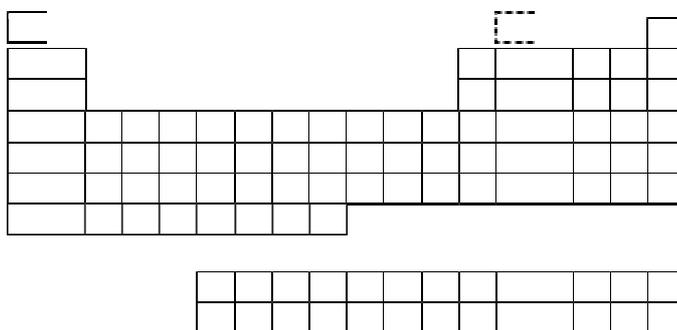
Whether the atom will gain or lose electrons depends on which requires the least energy. Since it will be easier to gain one electron than lose seven, fluorine will tend to gain one electron creating an anion. So, fluorine will tend to form one bond.

Secret #7 the Driving Force

The driving force behind chemical bonding is the tendency of atoms to gain or lose electrons in order to obtain a noble gas configuration. If an atom requires two electrons to obtain a noble gas configuration then it will gain two electrons by sharing electrons (covalent) or by taking electrons (ionic).

Secret #7.5 Exceptions

It is extremely important that you remain flexible when study chemistry or any science because there are almost always exceptions to the rule. Therefore be prepared for complications or exceptions and learn these exceptions. Don't fight it, just go with it.



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