KEY – 7.3 CHECKING UP ?’s

1. There are countless combinations of those 100 elements. The ionic compounds can form numerous binary compounds, complex compounds, and compounds that have numerous atoms in different arrangements. Covalent compounds also constitute a wide assortment of combinations. Due to the capacity of carbon to form long chains, there are millions of organic compounds.
2. If an atom gains or loses electrons, it will assume a negative or positive charge. This new substance is called an **ion**. Notice that only electrons are transferred and no changes occur in the nucleus of the atom. The same number of protons and neutrons remain in the nucleus.
3. **Ionic compounds** form due to differences in the electronegativity between two atoms and **electrons are transferred** to the more negative atom. **The ionic compound is held together by the attraction between the positive and negative ions.** The charge on the positive ion must balance with the charge on the negative ion. If the positive ion (cation) has a charge of 2+ and the negative ion (anion) has a charge of 1-, then you need two anions to balance the 2+ charge of the cation.
4. A polyatomic ion is a **combination of covalently bonded** **atoms** with a net ionic charge. For example, the carbonate anion has a -2 charge and it is the combination of one carbon and three oxygen atoms (CO3, with a -2 charge). An example of a compound with a polyatomic ion is potassium carbonate (K2CO3).
5. **Molecular compounds** (aka: **covalent compounds**) are formed when **two atoms share electrons** to fill their octet. Neither atom in the bond can totally pull an electron from the other atom as occurs with ionic bonds. Carbon dioxide is a good example of a molecular compound. The carbon and oxygens bond by sharing electron pairs. Since most atoms bond to have eight electrons in the outer shell (with the exception of hydrogen and helium), CO2 is formed by two oxygen atoms each sharing a pair of electrons with a carbon atom. The carbon atom, in turn, shares a pair of electrons with each oxygen atom.
6. Ionic bonds are formed by the complete *transfer* (give/take) of electrons between two atoms. Covalent bonds form when electrons are *shared* (no one loses or gains) between atoms.