**Honors Chemistry**

**Chapter 7 Exam Review Sheet**

1. Make sure you have read the entire chapter.
2. Be able to define all of the chapter 7 vocabulary words.
   1. Including:

* electron dot
* structure
* ionic compound
* valence electron
* ionic bond
* chemical formula
* halide ion
* alloy
* octet rule
* formula unit
* coordination number
* metallic bond

1. Know the number of valence electrons (electrons in the highest occupied energy level of an atom) for the elements in the representative groups 1A-7A.
2. Know the charges of the ions for the elements in the representative groups 1A-7A.
3. The maximum charge an ion is likely to have is -3 or +3.
4. Be able to write the electron configurations for both the ions and the atoms in the representative groups 1A-7A and for the transition metals.
   1. Note: the ions for these elements will have a pseudo noble gas configuration.
5. Be able to identify the number of electrons an element gives up or takes on when it forms an ion.
   1. Metals donate electrons when they form ions. They will have positive charges. (Cations)
   2. Nonmetals take on electrons when they form ions. They will have negative charges. (Anions).
6. A pseudo-noble gas for a transition metal contains a **full 3d sublevel**.
   1. Cu+, Zn2+, have a pseudo-noble gas configuration.
7. Be able to write the correct formula unit for an ionic compound.
   1. The overall charge of a **correct formula unit is zero.**
   2. use the criss-cross method to write formulas.
8. Be able to write the correct electron configuration for the all of the elements, all of the ions that the elements form and be able to identify the correct charge for all of the ions that they form.
   1. **Including but not limited to:**
      1. Li, Mg, He, Sn, Si, Ca, Ga, Sr, Ag, Ba, Cu, Fe, Ni, K , Mn, Br, I, Cd, N, P, F, O, Cr, Sn4+, F-, Sn4+, O2-,
9. The formula for sodium sulfate is Na2SO4.
10. The **condensed (abbreviated) electron configuration** distinguishes the core electrons from the valence electrons. CORE electrons are tightly held to the nucleus and resemble a noble gas configuration. VALENCE electrons are the outer most electrons and are involved in chemical reactions.
11. Examples of full & condensed (abbreviated) electron configuration:

***Full electron configuration Condensed (abbreviated) electron configuration***

* 1. **Li : 1s2 2s1** **Li:[He] 2s1**
  2. **Co: 1s2 2s2 2p6 3s2 3p6 4s2 3d7 Co:[Ar] 4s2 3d7**
  3. **Br: 1s2 2s2 2p6 3s2 3p6 4s2 3d10 4p5 Br:[Ar] 4s2 3d10 4p5**
  4. **S2-:** **1s2 2s2 2p6 3s2 3p6 S2-:** **[Ne] 3s2 3p6**
  5. **Fe2+ : 1s2 2s2 2p6 3s2 3p6  4s0 3d6 Fe2+:[Ar] 4s0 3d6**

1. Alloys a mixture composed of two or more elements, at least one of which is a metal**.** Their properties are often superior to their component elements. EX:
   1. Bronze is tougher than pure copper
   2. Steel resists corrosion & is strong than iron. Steels have a wide range of uses.
   3. Some are substitutional alloys and others are interstitial alloys.
2. Be able to identify the properties of ionic compounds. Ex:
   * 1. They are made of cations & anions bonded together.
     2. They are crystalline solids at room temperature
     3. They have high melting points
     4. They conduct electricity when they are dissolved in water or melted.
3. Be able to identify the shape & coordination number of ions in a crystal. The **coordination number** of an ion is the number of ions of opposite charge that surround the ion in a crystal. Ex:
   1. Body-centered cubic, 8
   2. Face-centered cubic, 12
   3. Hexagonal close-packing, 12