Chemical Bonding Review

**Chapter 7**: Ionic and Metallic bonding Pages 187-203

**Section 7.1 Ions Pages 187-193**

Define the following:

* Valence electrons
* How to find the number of valence electrons
* Electron dot structures
* Octet Rule
* Halide Ion

Questions:

1. Why do metals tend to lose their electrons? Why do nonmetals tend to gain electrons?

**A: Metals lose electrons and nonmetals gain electrons in order to get a full octet.**

2. How is a cation formed? How is an anion formed?

**A: Loss of electrons make a cation, gain or electrons makes an anion.**

3. In forming a compound, atoms tend to achieve the electron configuration of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**A: noble gas**

4. How many valence electrons in the following elements and draw the electron dot structure for each one:

a) sodium **A: one** b) nitrogen **A: five** c) calcium **A: two**

**Section 7.2 Ionic Bonds and Ionic Compounds Pages 194-199**

Define the following:

* Ionic compounds
* Ionic bonds
* Chemical formula
* Formula unit
* Take note of questions 18,19, 20 Page 199- understand them, but we did this a lot so I don’t think we need to do more of this☺

Questions:

1. Use electron dot structures to determine formulas of the ionic compounds formed when:

a) potassium reacts with iodine

b) aluminum reacts with oxygen

2. Name three properties of ionic compounds.

A: crystalline solids at room temperature, high melting points and conduct electricity when dissolved in water.

3. Describe the arrangement of sodium ions and chloride ions is a crystal of sodium chloride.

A: A solid containing positive sodium ions and negative chloride ions in an alternating, regular and repeating 3D pattern.

4. Why do ionic compounds conduct electric current when they are melted or dissolved in water?

A: The ions are free to move.

**Section 7.3 Bonding in Metals Pages 201-203**

Define the following:

* Metallic Bonds
* Alloys
* Substitutional Alloy
* Interstitial Alloy

Questions:

1. How do chemists model the valance electrons in metal atoms?

**A: metal cations surrounded by a sea of mobile valance electrons**

2. Why are alloys more useful than pure metals?

**A: The properties of alloys are often superior to their component elements.**

3. What are three different packing arrangements found in metallic crystals?

**A: body-centered cubic, face-centered cubic, hexagonal close-packed**