**Copy** these notes in your notebook to begin this **new chapter**.

**Bonding**

bonding: any joining together of atoms or molecules

chemical bond or intramolecular bond: a strong bond between atoms or individual ions, resulting from the sharing or transfer of electrons

ionic bond: when a positive ion (cation) and a negative ion (anion) are held together by the electrical attraction of their charges.

* ionic bonds occur between ions, usually between a metal ion and a non-metal ion.
* Have extremely high melting points
* Tend to be soluble in water.
* Usually form a crystalline lattice structure as a solid.
* Are good conductors of electricity in the molten state.

covalent bond: when two atoms form a bond by sharing (“co-“) their valence (“-valent”) electrons.

* covalent bonds occur only between non-metals
* Usually do not conduct electricity
* Have low melting points
* Liquids and gases at room temperature

metallic bond: when atoms in a metal form a network of positive ions and loosely held electrons.

* metallic bonds, as the name suggests, occur only between metals
* metallic bonds are often described as a “sea of electrons” because the valence electrons are free to move from one atom to another. This is how metals conduct electricity.
* better conductors of heat and electricity than ionic and molecular compounds.
* Malleable, ductile and shiny

Use your notes and periodic table to answer the following. This also checks to see if you are following directions.

a. Tell whether each of the bonds would be covalent, ionic or metallic.

b. If they are ionic, indicate which atom would be the *cation* and which atom would be the *anion*.

c. For each compound, tell a property of those types of compounds (don’t use the same properties over and over again).

Example:

CCl4: Covalent (two non-metals)—poor conductor

KCl: Ionic (a metal and a non-metal)—dissolve in water

* Cation: K+ (because K wants to lose 1 electron)
* Anion: Cl- (because Cl wants to gain 1 electron)

Ag: Metal (only contains a metal)-shiny

You practice:

1. NaF
2. CH4
3. PBr3
4. BF3
5. SO2
6. Fe
7. MgCl2
8. CH2OH
9. CaO
10. Na2CO3
11. Water
12. Ammonia
13. Sodium oxide
14. Aluminum chloride
15. Silicon dioxide
16. Phosphorus dioxide
17. Silver
18. Chlorine gas
19. Lithium iodide
20. Ammonium nitrate