**Notes – Properties of Ionic, Covalent, and Metallic Bonds**

**Properties of Ionic Bonds**

Low volatility

Strong Bonds

Soluble in water

High Melting Point

Form a crystal lattice

Form between metal and nonmetal

Involve cations and anions

Conduct electricity in water

**Properties of Covalent Bonds**

High volatility

Weak bonds

Insoluble in water

Low melting point

Form a molecule

Form between two nonmetals

Can be polar or non-polar

Can create diatomic molecules

**Conductivity** – One way to assess the dissociation tendency of a compound in water is to test for the solutions ability to conduct electricity. If an aqueous solution of the compound does not conduct, it is called a non-electrolyte. If there is conduction in an aqueous solution, the compound is called an electrolyte. Charged particles must be present and free to move in order for an electric current to flow. The amount of conduction by the solution gives an indication of the compound’s ionic character. Indeed, conduction or non-conduction by the solution gives an indication of the bond type that exists in the compound. **Covalent compounds don't conduct electricity in water.**

**Properties of Metallic bonds**

Form between a metal cation and freely moveable shared “sea” of electrons

Make alloys like copper, gold and steel

Malleable

Ductile

Conductivity

Hardness

Luster