

Review

- ⊙ How can you determine the number of valence electrons in an atom of a representative element?
- ⊙ How many valence electrons are in each of the following atoms?
 - Potassium
 - Carbon
 - Magnesium
 - Oxygen
- ⊙ Draw the electron dot structure for each of the above elements.
- ⊙ How many electrons will each of the following gain or lose in forming an ion?
 - Calcium
 - Fluorine
 - Aluminum
 - Oxygen

Types of Bonds

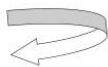
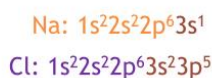
- **Remember...**All atoms want _____ electrons. Bonding occurs to satisfy this need for the electrons!
- _____ bonds form between _____ & _____ and are the result of _____ being transferred from one atom to another.
- _____ bonds form between _____ & _____ because of _____ electrons that flow through all atoms' shells.
- _____ bonds form between _____ & _____ and electrons are _____ between atoms.

Ionic Bond Formation

• Sodium Chloride

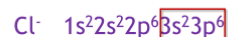
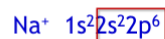
IONIC BONDING: THE FORMATION OF SODIUM CHLORIDE

- Sodium has 1 valence electron
- Chlorine has 7 valence electrons
- An electron transferred gives each an octet



IONIC BONDING: THE FORMATION OF SODIUM CHLORIDE

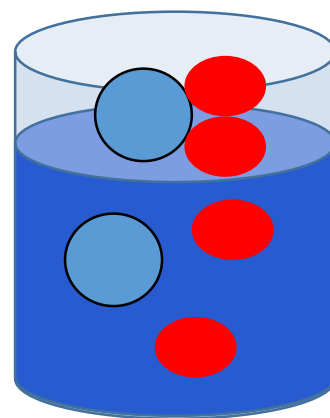
This transfer forms ions, each with an **octet**:



- See *Ionic Bond Formation worksheet* for more examples.
- Ionic compounds form solid _____ at ordinary temperatures. The compound has a characteristic crystal lattice of alternating _____ and _____ ions.

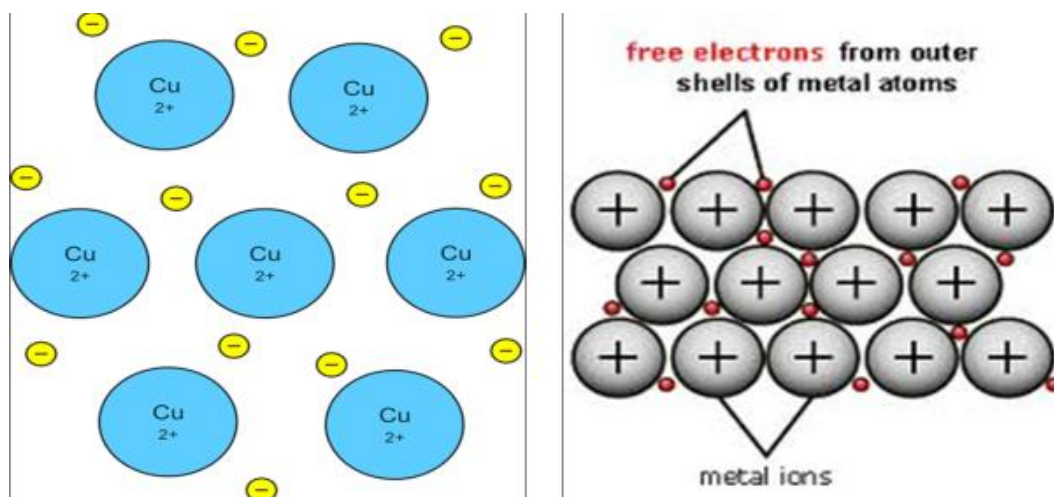
Properties of Ionic Compounds

- Crystalline _____ at room temperature.
- _____ melting points.
- Conduct electricity when _____ or _____.
- _____ in water.
 - **Dissociation**
 - In water, ionic compounds break up into the _____ of which they are composed.
See diagram to the right.



Metallic Bonding

- _____ are packed closely together.
- Valence electrons can exist in a _____.
- There is still an attraction between free floating electrons (negative) and metal cations (positive).



Properties of Metals

- Good _____ of heat and electricity.
- Metals are _____ and _____.
- Have high tensile strength.
- Metals have _____.
- _____ in water.

Alloys

- A _____ of 2 or more metals have superior properties to their components.
 - **Substitutional Alloy:** some metal atoms replaced by atoms of _____ size.
 - **Interstitial Alloy:** holes in the closest packed metal structure are occupied by _____ atoms.