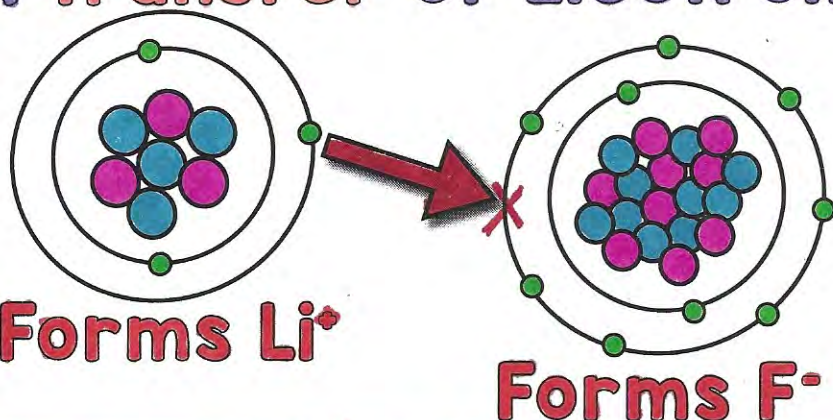


IONIC BONDING

A Transfer of Electrons



Electrostatic force between oppositely charged ions forms an ionic compound - LiF

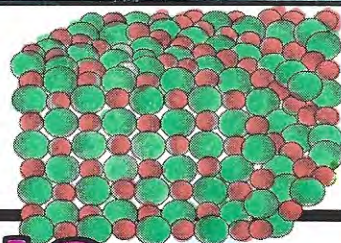
Metals lose electrons, and form positive ions called cations

Nonmetals gain electrons, and form negative ions called anions

Properties of Ionic Compounds

- Between metal and nonmetal ions, or polyatomic ions - net charge equals Zero
- High melting point & boiling point - most are solid at room temperature.
- Most form a crystal lattice structure.
- Hard, but brittle & rigid
- Conduct electricity in molten or dissolved state.

Ionic compounds form a crystal lattice formation, and are also called salts.



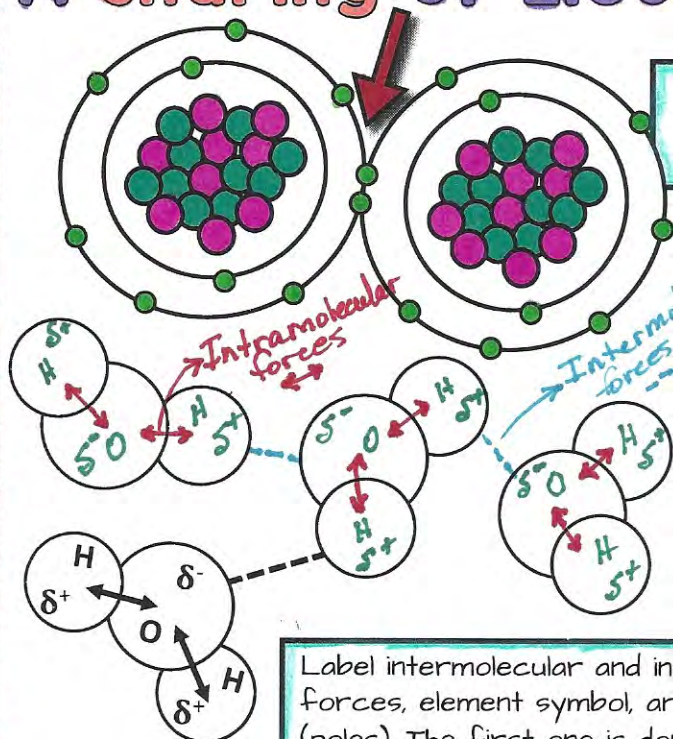
COVALENT BONDING

A Sharing of Electrons

define

molecule: a neutral group of covalently bonded atoms

Draw diagrams to represent polar and nonpolar covalent molecules.



POLAR

END = 0.3 - 1.7

NONPOLAR

END = 0.0 - 0.3

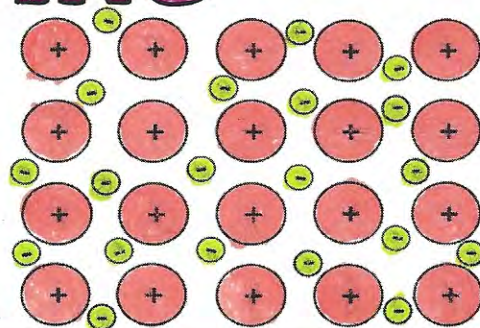
Properties of Molecular Compounds

- Between nonmetal and nonmetal
- Low melting point & boiling point
- Can have partially charged poles.
- Do NOT conduct electricity.

METALLIC BONDING

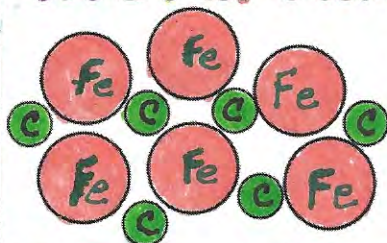
A Sea of Electrons

In metals, electrons are delocalized, free to roam about among structured positively charged Cations.
Valence-level *p* orbitals are vacant, while *d* orbitals are nearly empty. These orbitals overlap.



Metal Alloys

a solution of metals!



Metal atoms can replace other metal atoms, or occupy space between larger metal atoms to form metal alloys.

Properties of Metals

1. Good conductors of heat and electricity
2. malleable
3. ductile
4. Strong absorbers and reflectors of light.

Example Alloys:

steel, brass, bronze
stainless steel, sterling silver

Comparing Chemical Bonding

	IONIC	COVALENT	METALLIC
Types of Atoms	metal to nonmetal	Nonmetal to Nonmetal	metal
Method of Bond Formation	Transfer of electrons	Sharing of electrons	Sea of electrons
Type of Structure	High	molecule	sea of electrons
Melting Point	High	Low	High
Electrical Conductivity	Good, if in molten or dissolved state	Does not conduct electricity	Good conductor
Other Properties	Strong Attractive forces	Weak Attractive Forces	malleable, ductile
Images – Draw an image that represents the bond type for each of the chemical bonds.			