Types of Compounds

- When atoms are close enough together that their electrons can interact, they may form a chemical bond
- Chemical bonds may be ionic or covalent

Ionic Bonding

- Occur between a metal and a non-metal
- The metal loses its valence electrons to form a positive charged ion called a cation
- The nonmetal gains enough electrons to fill its valence shell and forms a negative charged ion called an anion.
- Ionic bonds form because the + charged cation are attracted to the − charged anion

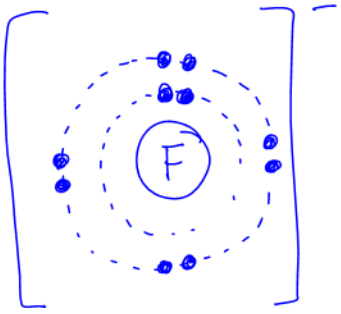
Sodium ion.
atomic number: 11
Ionic charge: +1
→ protons 11
→ electrons 10

Bohr Diagrams of Ions

- To indicate that ions are formed, we include charge and the square brackets
- Electrons are drawn as pairs

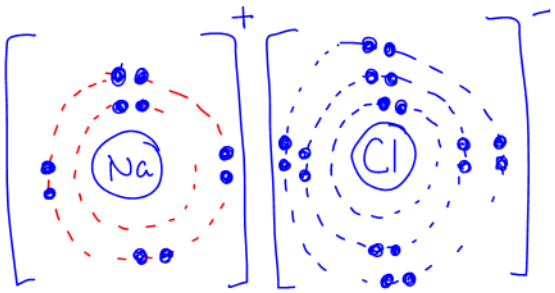
Eg: Fluorine:

atomic number: 9
ionic charge: −1
9 protons
10 electrons



Examples

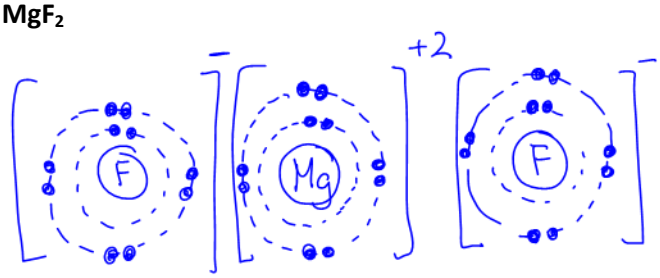
NaCl



Na: protons: 11
ion charge: +1 ; 10e

17p
ion charge: −

MgF_2



Covalent Bonding

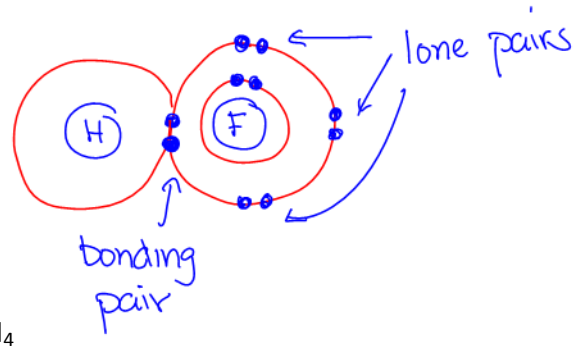
- Occur between two non-metals
- Valence electrons are shared when the valence shells overlap slightly
- A covalent bond forms when the electrons are shared.
- Electrons that are shared are called bonding pairs
- Electrons that are not shared are called lone pairs.
- Each atom tries to fill its valence shell to form a stable octet (8 electrons in outer shell)

Bohr Diagrams of Covalent Compounds

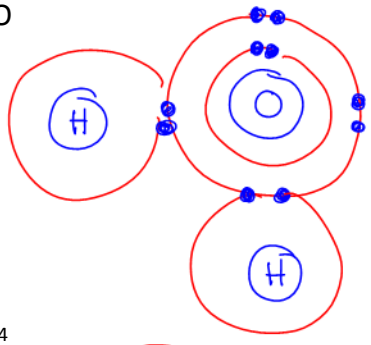
- Occur between two _____
- Valence electrons are _____ when the valence shells overlap slightly
- A _____ forms when the electrons are _____.
- Bohr diagrams can be used to show simple covalent compounds

Examples:

HF



H_2O



CH_4