

## Covalent Bond Notes

1. Atoms with **less than 8 valence electrons** are not stable.

a. Some Atoms can **SHARE** electrons to become more stable.

2. Covalent Bonding occurs when two or more atoms **share** electrons

a. Instead of opposite charges attracting, the **force** of the bond comes from the **individual atom's nucleus**.

b. Each atom's nucleus is attracted to the shared electrons at the same time.

c. The covalent bonding of atoms result in a **molecule** that is neutral (definition of molecule)

d. Compounds that bond Covalently are referred to as **MOLECULAR COMPOUNDS**

3. Bonding Guidelines

a. Covalent bonds usually form **between nonmetals** and **nonmetal** to **metalloids**.

b. **Diatomic molecules** (same atom)  
bond this way

- i. **Example:** Hydrogen is  $H_2$ ,  
Nitrogen is  $N_2$ , and Fluorine is  $F_2$

ii. **Lewis Dot Diagram:**

4. **Covalent Compound Properties**

- a. Has lower melting and boiling points
- b. Poor conductor of electricity
- c. Can be solid, liquid or gas at room temperature.

5. **Polar and Nonpolar Bonds**

- a. Atoms that share **equally** are called **NONPOLAR**
  - i. **Example:** Fluorine bonding with Fluorine

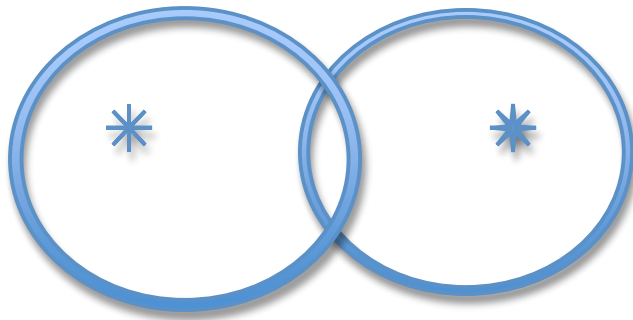
ii. **Lewis Dot Diagram:**

- b. Sometimes the atoms share the electrons unequally
- c. Atoms of some elements pull more strongly than another

d. The **unequal sharing** of electrons causes the bonded atoms to have slight electrical charges, this is known as a **POLAR BOND**.

1. The atom with the stronger pull is slightly negative while the weaker atom is slightly positive.
- ii. **Example:** Hydrogen bonding with Fluorine
- iii. **Lewis Dot Diagram:**

# Graphic Summary of Chemical Bonding



Equal sharing of electrons-Covalent  
nonpolar



Electrons shared unequally-Polar