Forming Compounds  
Science 10 Notes  

**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**.

**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: 11 protons; ion charge: +1; 10 electrons
  - Cl: 17 protons; ion charge: −1

- **MgF₂**
  - Mg: 12 protons; ion charge: +2
  - F: 9 protons; ion charge: −1
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 **non-metals**
- Valence electrons are **shared** when the valence shells overlap slightly
- A **covalent bond** forms when the electrons are **shared**.
- Bohr diagrams can be used to show simple covalent compounds

Examples:

- **HF**
  - Bonding pair
  - Lone pair

- **H₂O**
  - Bonding pairs

- **CH₄**
  - Bonding pair