Forces of Attraction between particles

Intramolecular Forces - Between atoms
- ionic bonds
- covalent bonds

Very strong

Intermolecular Forces - Between molecules
- only for molecular compounds
- weaker than intermolecular forces
- used to explain the physical properties of molecular compounds

Types of Intermolecular Forces

1. London Dispersion force
   - found in all molecules
   - considered to be the weakest force
   - caused by the attraction between electrons of one molecule being attracted to the nuclei of the other molecule

Due to the strength of the force is directly related to the number of electrons in the molecules. For example: The states of the halogens \( \text{F}_2(s) \rightarrow \text{F}_2(g) \)

2. Dipole - Dipole
   - force of attraction between polar molecules
   - stronger than the London dispersion force

Ex. HF has a high boiling point

\[
\text{H-F} \quad \longrightarrow \quad \text{H-F} \\
\uparrow \quad \quad \quad \uparrow \\
\uparrow \quad \quad \quad \uparrow \\
\text{F} \quad \quad \quad \text{F}
\]

Dipole-dipole force
3. Hydrogen bonding
   - Strongest intermolecular force
   - Force of attraction between \(^{\prime}H\) and very electronegative atoms \(\text{O, N}\)

Examples:
- \(H_2O\)
- \(\text{CH}_3\text{OH}\)