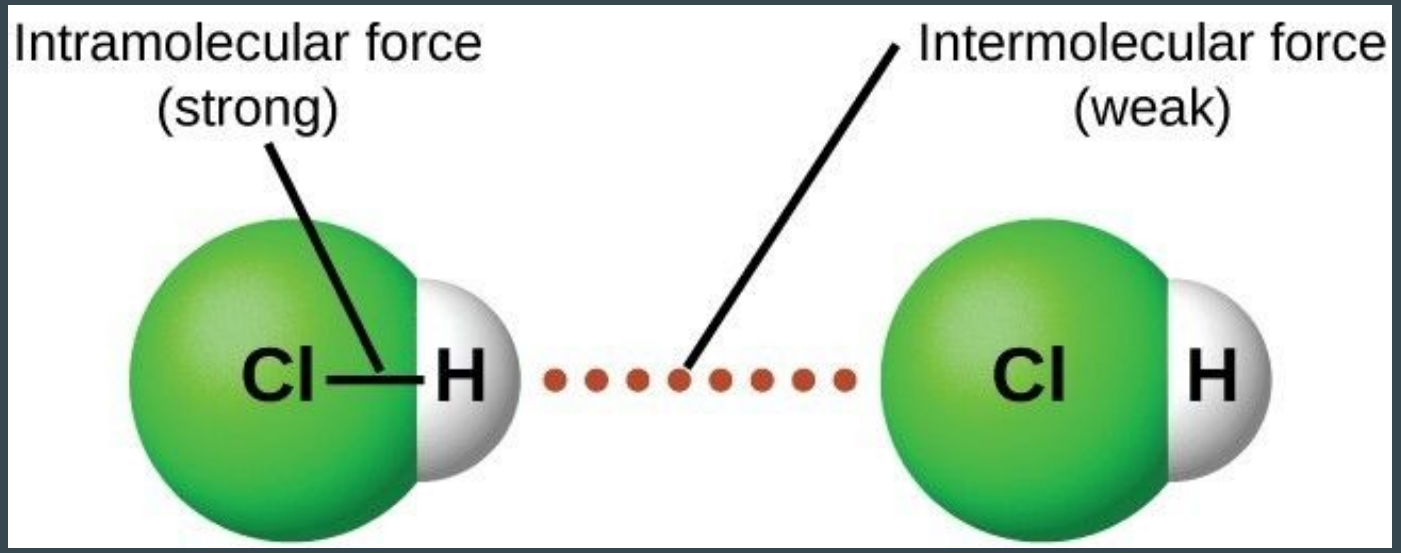


...

Unit 6: Molecular Geometry and IMFs

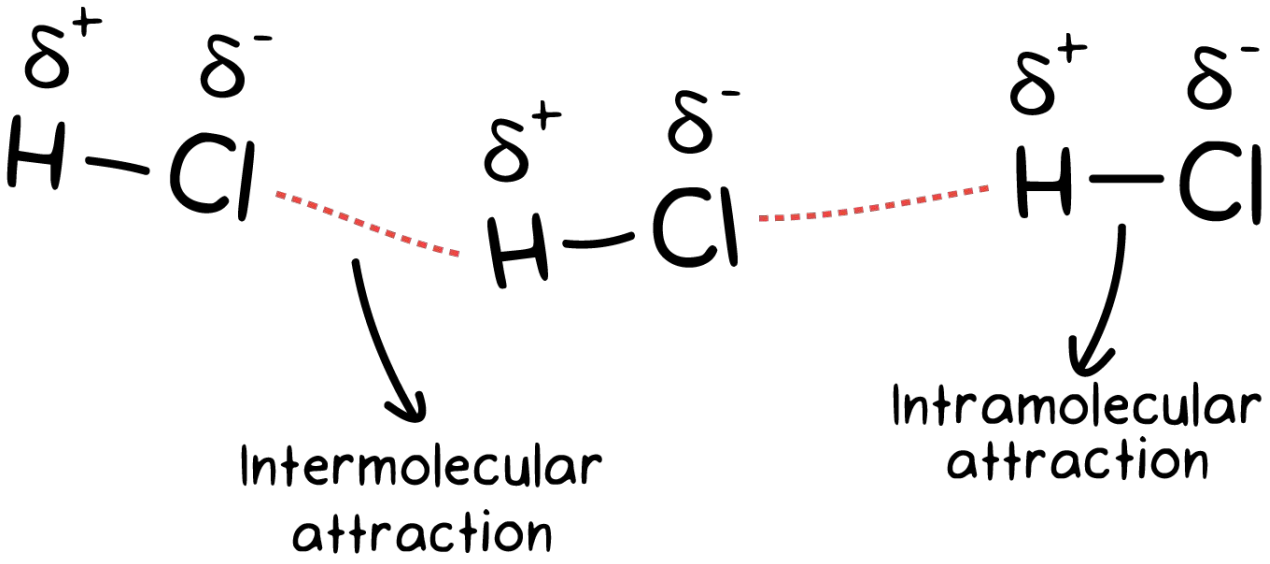
Introduction to Intermolecular Forces (IMFs)

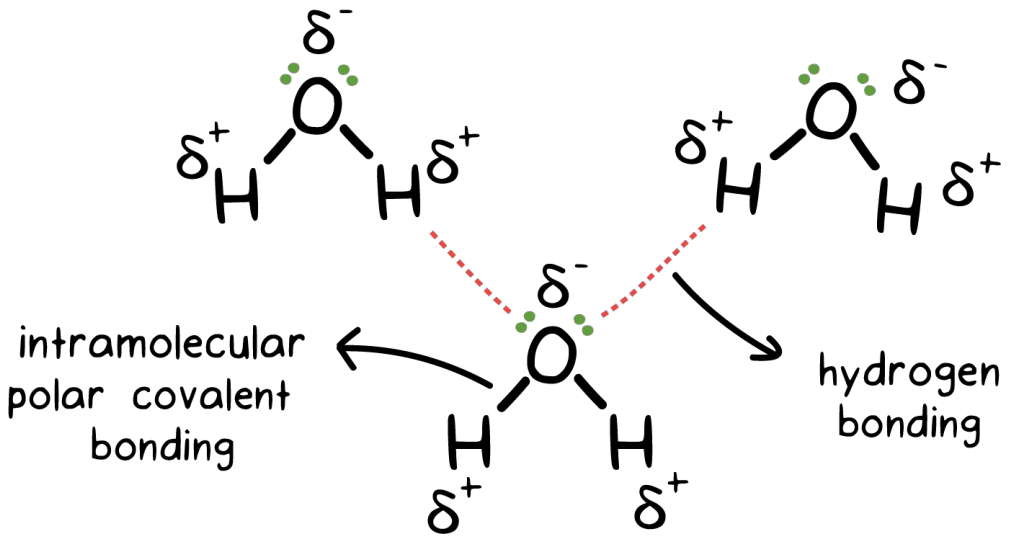
Compound Strength (Strongest to Weakest)

Ionic > Covalent > Metallic

Intramolecular and **Inter**molecular Forces

- **INTRA**molecular forces: Forces that hold atoms together in a molecule
  - Intra means "within"
  - **BONDS**! (Ionic, Covalent, Metallic)
- **INTER**molecular Forces: The attractions between molecules
  - Inter means "between"
  - Attraction **between** positive and negative ends of **molecules** to **other** charged ends of **molecules**

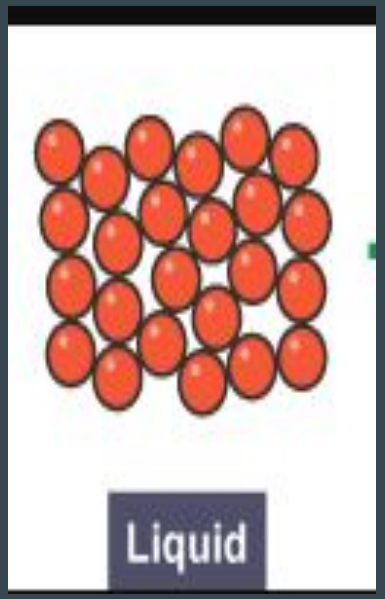

δ+ δ-
H—Cl
δ+ δ-
H—Cl
δ+ δ-
H—Cl
Intermolecular attraction
Intramolecular attraction


δ-
δ+ H O H δ+
δ+ H O δ-
H δ+
δ-
O
H δ+
H δ+
intramolecular polar covalent bonding
hydrogen bonding

Overcoming **Inter**molecular vs **Intra**molecular Forces

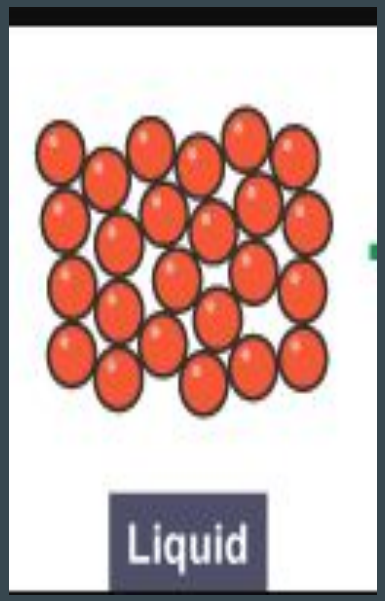
- Energy is required to overcome (break) intramolecular and intermolecular forces
  - Overcoming **INTRA**molecular forces = breaking chemical bonds (new substances)
  - Overcoming **INTER**molecular forces = phase changes (evaporation, melting, etc)
    - To measure IMF's we look at physical properties like MP, BP, and viscosity

Melting Point

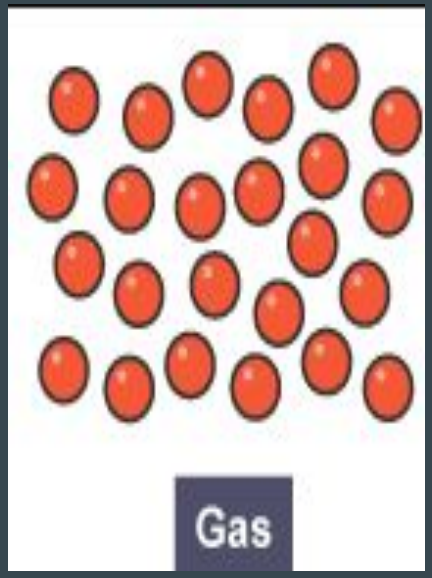


- IMF's hold particles together, therefore…

Stronger IMFs
=
More energy to separate
=
Higher MP and BP



Boiling Point



Review of Bond & IMF Strength