

MOLECULAR SOLIDS (e.g. Ice, H₂O, Dry Ice, CO₂)

Particles

- Molecules

Forces within molecules

- Strong covalent bonds between non-metal atoms.

Forces between molecules

- Weak **intermolecular forces**
 - It is this force that needs to be broken to melt a molecular solid

Properties

- **Conductivity:** Non-conductors of electricity as there are no free mobile charged particles (ions or electrons) that can carry a current.
- **Melting and Boiling points:** Molecular solids have weak intermolecular forces between molecules that take very little heat energy to overcome. Therefore they have low melting and boiling points

Solubility: There are 3 forces involved in dissolving:

- Solute-solute forces
- Solvent-solvent forces
- Solute-solvent forces

Substances will dissolve if the solute-solvent forces between particles are **stronger** than the solute – solute forces and solvent-solvent forces

- Polar substances dissolve best in polar solvents as their intermolecular forces are of a similar strength.

Non – polar solvents dissolve best in non-polar solvents as their intermolecular forces are of a similar strength.

Other Properties:

- INTERMOLECULAR FORCES between polar molecules are stronger than those between non-polar molecules of a similar size.
 - Polar molecules have higher melting point and boiling point than non-polar molecules of a similar mass
- A stream of a polar liquid will be **attracted** to a small electric field (e.g. water and a charged plastic rod – the water will be deflected towards the charged rod because water has slight charges)