Chapter- 3 (Metals and Non-metals)

Ionic Compounds

The electrostatic attractions between the oppositely charged ions hold the compound together.

Example: $MgCl_2$, CaO, MgO, $NaCl$, etc.

Properties of Ionic Compound

Ionic compounds

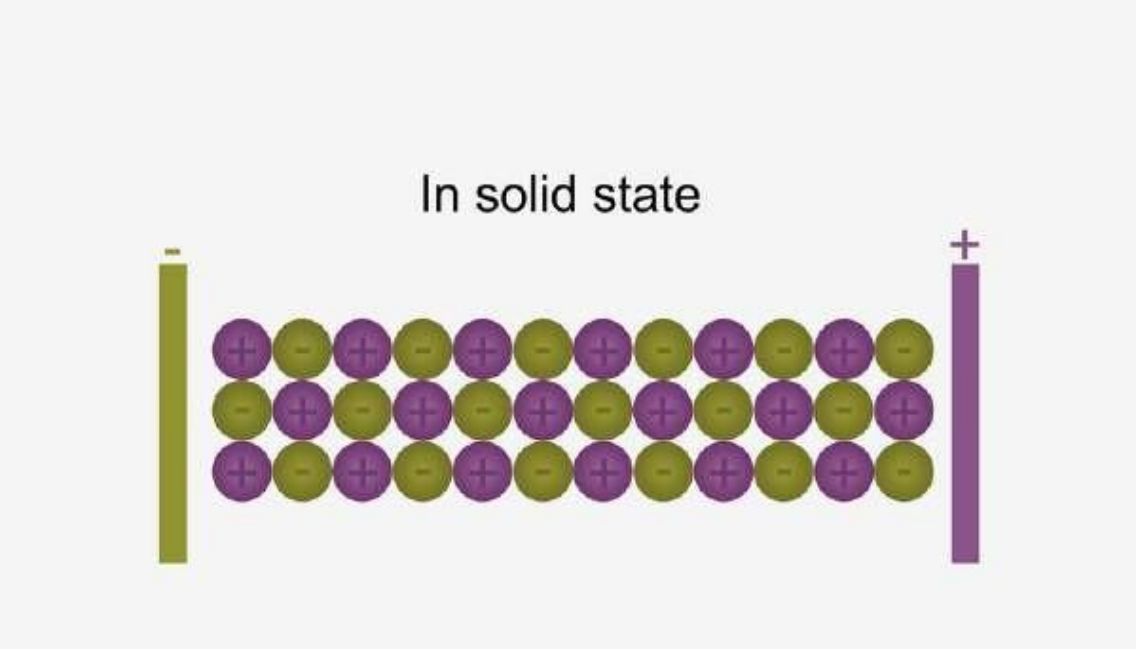
1. Are usually crystalline solids (made of ions).
2. Have high melting and boiling points.
3. Conduct electricity when in aqueous solution and when melted.
4. Are mostly soluble in water and polar solvents.

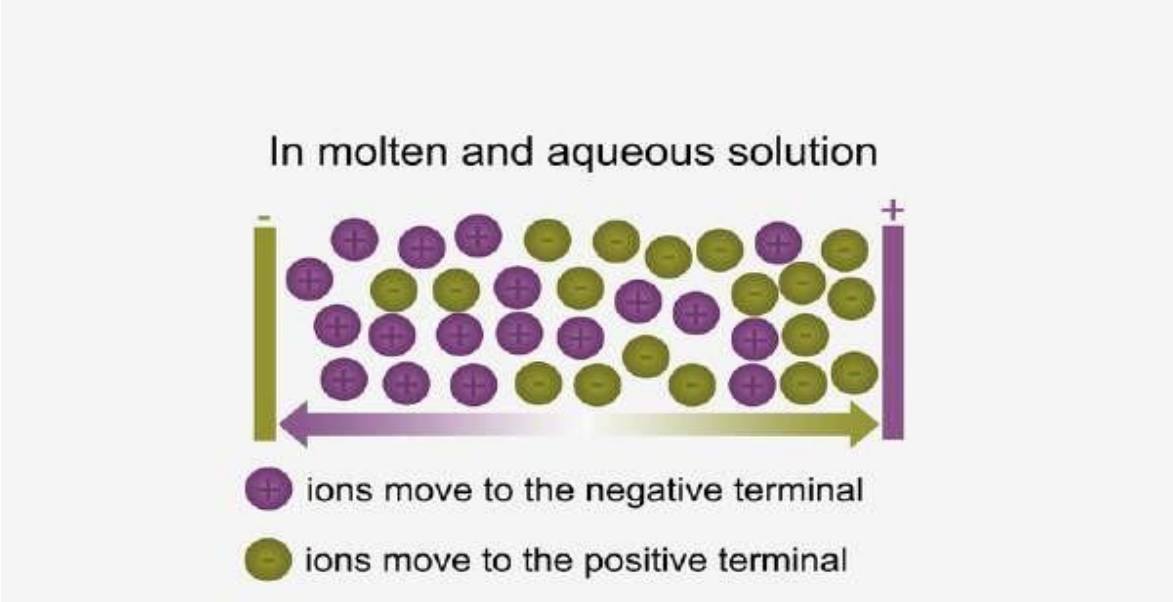
Physical Nature

Ionic solids usually exist in a regular, well-defined crystal structures.

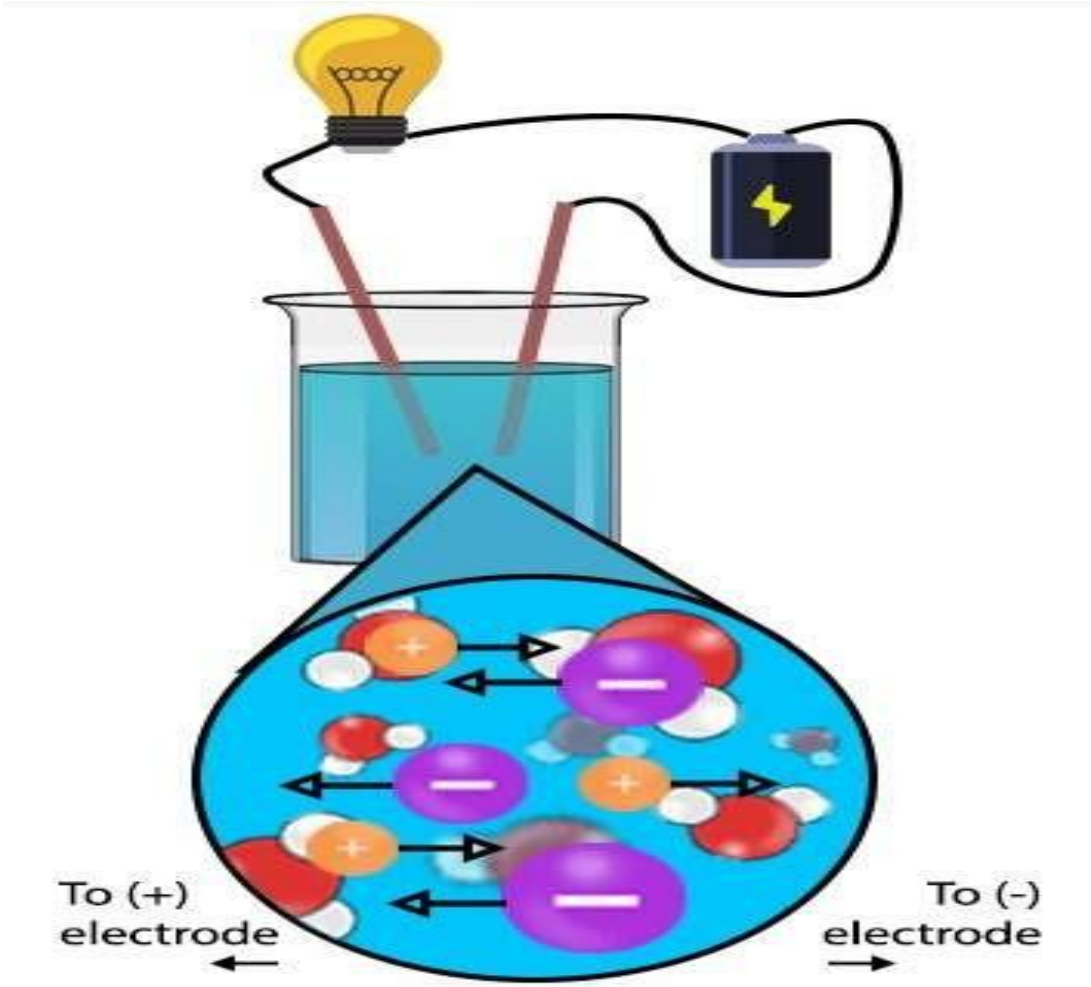
Electric Conduction of Ionic Compounds

Ionic compounds conduct electricity in the molten or aqueous state when ions become free and act as charge carriers.
In solid form, ions are strongly held by electrostatic forces of attractions and not free to move; hence do not conduct electricity.





For example, ionic compounds such as NaCl does not conduct electricity when solid conduct electricity but when dissolved in water or in molten state, it will conduct electricity.

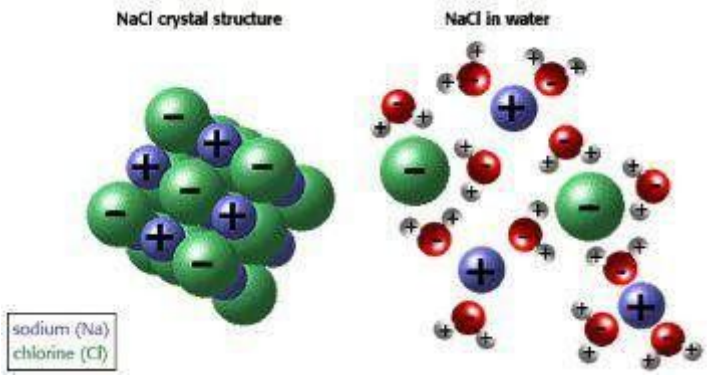


Salt solution conducts electricity

Melting and Boiling Points of Ionic Compounds

In ionic compounds, the strong electrostatic forces between ions require a high amount of energy to break. Thus, the melting point and boiling point of an ionic compound are usually very high.

Solubility of Ionic Compounds



Most ionic compounds are soluble in water due to the separation of ions by water. This occurs due to the polar nature of water.

For example, $NaCl$ is a 3-D salt crystal composed of Na^+ and Cl^- ions bound together water, the partial positively charged ends of water molecules interact with the Cl^- ions, through electrostatic forces of attractions. When a crystal of NaCl comes into contact with while the negatively charged end of the water molecules interacts with the Na^+ ions. This ion-dipole interaction between ions and water molecules assist in the breaking of the strong electrostatic forces of attractions within the crystal and ultimately in the solubility of the crystal.

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