

Changes of State

Chapter 8: A Journey through States of Water · Topic 3

Key Concept

These changes of state are physical changes, meaning the substance itself (like water, H_2O) remains chemically the same — only its physical form changes. The temperature at which a substance melts or boils is a fixed physical property for that substance under given conditions; for instance, water always melts at $0^{\circ}C$ and boils at $100^{\circ}C$ at sea-level atmospheric pressure, but this can shift slightly at different altitudes or pressures, such as boiling at a lower temperature on a high mountain.

Quick Revision Notes

- Melting: solid $\rightarrow$ liquid. Freezing: liquid $\rightarrow$ solid.
- Evaporation: liquid $\rightarrow$ gas (at the surface, any temperature). Boiling: liquid $\rightarrow$ gas (throughout, at a fixed temperature).
- Condensation: gas $\rightarrow$ liquid.
- Water melts at $0^{\circ}C$ and boils at $100^{\circ}C$ at sea level; this can shift with altitude/pressure.

Practice Questions

- 1 At what temperature does water boil, and at what temperature does ice melt?
- 2 Explain the difference between evaporation and boiling.
- 3 Why might water boil at a lower temperature on top of a high mountain?