

Calorimetry

Chapter 11: Calorimetry · Topic 1

Key Concept

Specific heat capacity is the amount of heat needed to raise the temperature of 1kg of a substance by 1°C, calculated as $Q = mc\Delta T$.

Heat capacity depends on the mass, specific heat capacity of the substance, and the temperature change involved.

The principle of mixtures (calorimetry principle) states that heat lost by a hotter body equals heat gained by a colder body when mixed, assuming no heat loss.

Latent heat is the heat absorbed or released during a phase change (like melting or boiling) without a change in temperature.

Quick Revision Notes

- Specific heat capacity: heat to raise 1kg by 1°C.
- Formula: $Q = mc\Delta T$.
- Heat capacity depends on mass, specific heat, temperature change.
- Principle of mixtures: heat lost = heat gained (no loss).
- This applies when mixing hot and cold bodies.
- Latent heat: heat during phase change.
- No temperature change occurs during phase change.
- Examples: melting, boiling.

Practice Questions

- 1 Calculate heat required to raise 2kg of water by 10°C ($c=4200 \text{ J/kg}^\circ\text{C}$).
- 2 Solve a mixture problem finding final temperature.
- 3 Discuss latent heat with an example like melting ice.
- 4 Research specific heat capacities of different substances.
- 5 Explain the principle of mixtures in your own words.
- 6 Solve a calorimetry problem involving heat loss and gain.