

Unit 5 – Thermochemistry
Chapter 13 – States of Matter
Chapter 17 – Thermochemistry

STUDY GUIDE

Vocabulary

- Allotrope
- Amorphous solid
- Atmospheric pressure
- Barometer
- Boiling point
- Evaporation
- Kinetic theory
- Melting point
- Sublimation
- Vacuum
- Vaporization
- Calorimeter
- Endothermic
- Exothermic
- Enthalpy
- Heat
- Heat capacity
- Law of conservation of energy
- Thermochemical equation
- Thermochemistry
- **Honors:** Hess's Law

Equations/Conversions

$$1 \text{ atm} = 760 \text{ mm Hg} = 101.3 \text{ kPa} = 760 \text{ torr}$$

$$1 \text{ calorie} = 4.184 \text{ J}$$

$$1 \text{ kJ} = 1000 \text{ J}$$

$$1 \text{ kcal} = 1000 \text{ cal} = 1 \text{ Cal}$$

$$\Delta H = m \times C_p \times \Delta T$$

$$\Delta H = \text{mol} \times \Delta H_{\text{phase change}}$$

Core Concepts

- Characteristics of the three states of matter: solids, liquids & gases
- What is gas pressure?
- Converting from Kelvin to degrees Celcius.
- Converting between units of pressure (kPa, torr, mm Hg, atm)
- When does water boil?
 - Temperature?
 - What does this have to do with kinetic energy?
- Changes of state:
 - Freezing/melting
 - Boiling/Condensing
- Which direction does heat flow?
- Characteristics of Exothermic & Endothermic Reactions
 - Is ΔH positive or negative?
 - Does heat enter (absorbed) or leave (released)?
 - Does the reaction “feel” hot or cold?
- Units for heat
- Heat lost = Heat gain according to Law of Conservation of Energy
- Which equation do you use when a temperature change is experienced?
- Which equation do you use when a phase change is experienced?
- Calculating the energy in a multi-step problem (one involving temperature & phase changes).
- Writing a thermochemical equation for an endothermic/exothermic reaction.
 - Use this equation to calculate energy lost/gained
- Energy level diagrams
- **Honors:** Use Hess's Law to calculate heats of reactions.