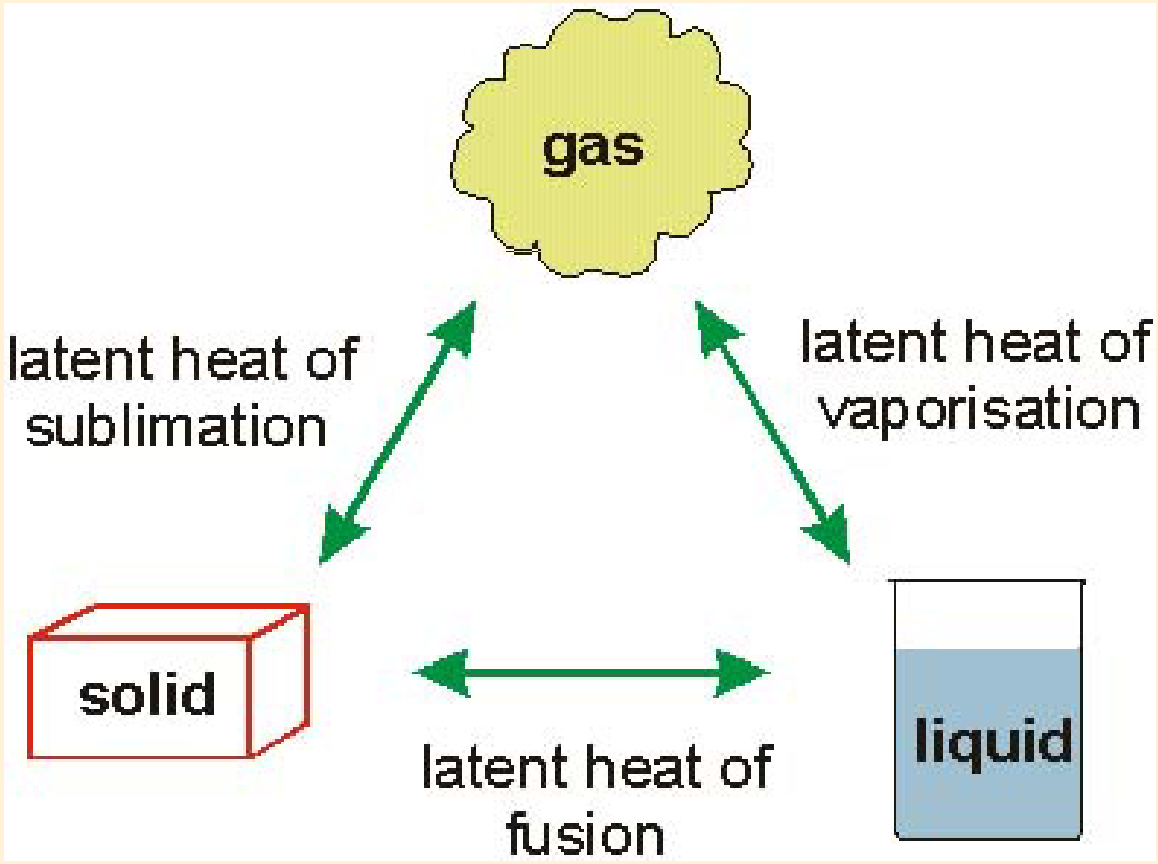
Thermochemical Equations

Notes 16 – Heat and Changes of State



Thermochemical Equations

Changes of State

- **Molar enthalpy (heat) of fusion** is the amount of heat required to melt one mole of a solid substance.
- Also known as the Latent Heat of Fusion.
- Latent means “hidden.”
- $q = n \times L$, where q is a quantity of heat, n is the number of moles, and L is the Molar heat of fusion.

Thermochemical Equations

Changes of State

- **Molar enthalpy (heat) of vaporization** refers to the heat required to vaporize one mole of a liquid substance.
- Also known as the Latent Heat of Vaporization.
- $q = n \times L$, where q is a quantity of heat, n is the number of moles, and L is the Molar heat of vaporization.

Thermochemical Equations

Practice Problem

- How much heat is required to melt 25.00 g of water?
- q = n x L
- n is the number of moles
- 18.02 g is the molar mass of water.
- 25.00 g / 18.02 g = 1.387 moles of water

Thermochemical Equations

Practice Problem

- q = 1.387 mol x L
- L = 6.01 kJ/mol (from Table 4, pg. 530)
- q = 1.387 moles x 6.01 kJ/mol
- q = 8.34 kJ

Thermochemical Equations

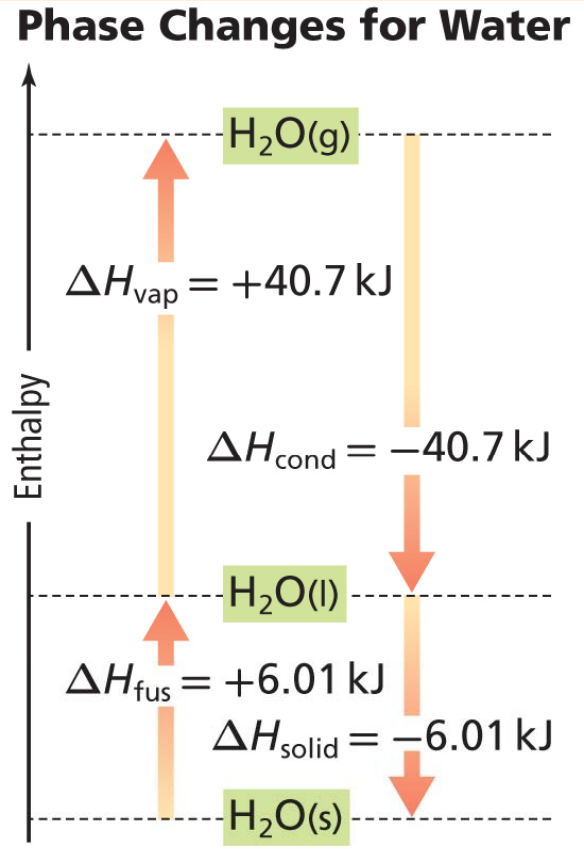
Changes of State (cont.)

Table 15.4 Standard Enthalpies of Vaporization and Fusion

Substance	Formula	ΔH°_{vap} (kJ/mol)	ΔH°_{fus} (kJ/mol)
Water	H_2O	40.7	6.01
Ethanol	C_2H_5OH	38.6	4.94
Methanol	CH_3OH	35.2	3.22
Acetic acid	CH_3COOH	23.4	11.7
Ammonia	NH_3	23.3	5.66

Thermochemical Equations

Changes of State (cont.)



Concepts In Motion