

CT Chemistry – Unit 9 Study Guide

Define the following terms:

Heat of fusion

Evaporation

Condensation

Intermolecular forces

Intramolecular forces

Polar-Polar attraction

Hydrogen bonding

Dispersion Forces

Heat vaporization

Boiling Point

Melting point

Heat of Fusion

Heat of Vaporization

Water Properties (melting point, Boiling point, etc.)

Condensation

Evaporation

What substances would be expected to have the highest melting point?

$H: \rightarrow low$
Ionic, polar, nonpolar

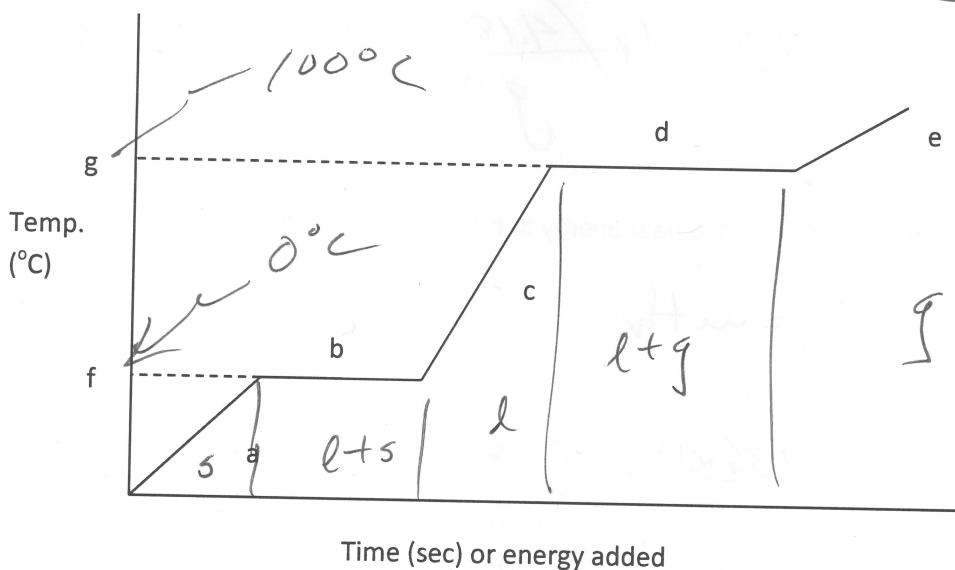
How much heat is required to melt 150.0g of ice at 0° C? ($H_f = 334.0J/g$)

The normal boiling point and melting of water in Kelvin, Celsius, and Fahrenheit?

273, 373K 0, 100° 32, 212°F

150g / 334.0J

g =
(50,100J)



Define all letters

Specific Heat of Ice	2.06 J/g°C
Specific Heat of Water	4.184 J/g°C
Specific Heat of Steam	2.03 J/g°C
Heat of Fusion	334 J/g
Heat of vaporization	2260 J/g

- I. Calculate the heat energy in Joules required to raise the temperature of 136.04 g of ice from -25.0°C to the melting temperature 0.0 °C

$$Q = m C_p \Delta T$$

$$\frac{136.04 \text{ g}}{\cancel{\text{g}}} \times \frac{2.06 \text{ J}}{\cancel{\text{g}^\circ\text{C}}} \times \frac{25^\circ\text{C}}{\cancel{^\circ\text{C}}} = 7,006 \text{ J}$$

- II. Continuing problem I., calculate the heat energy to melt the ice to water.

$$Q = m H_f$$

$$\frac{136.04 \text{ g}}{\cancel{\text{g}}} \times \frac{334 \text{ J}}{\cancel{\text{g}}} = 45,437 \text{ J}$$

- III. Continuing problem II., calculate the heat energy to raise the temperature of the water from freezing to boiling.

$$Q = m C_p \Delta T$$

$$\frac{136.04 \text{ g}}{\cancel{\text{g}}} \times \frac{4.184 \text{ J}}{\cancel{\text{g}^\circ\text{C}}} \times \frac{100^\circ\text{C}}{\cancel{^\circ\text{C}}} = 56,919 \text{ J}$$

- IV. Continuing Problem III., calculate the heat energy to boil all the water into steam.

$$Q = m H_v$$

$$\frac{136.04 \text{ g}}{\cancel{\text{g}}} \times \frac{2260 \text{ J}}{\cancel{\text{g}}} = 307,104 \text{ J}$$