



## Formulas

**Ideal Gas Law:**  $PV = nRT$

**Calorimetric Formulas –**

**Combined Gas Law:**  $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$

**No Phase Change:**  $Q = m(\Delta T)C_p$

**Pressure Formula:**  $P = \frac{F}{A}$

**Latent Heat of Fusion:**  $Q = m\Delta H_{fus}$

**Mass-Energy Formula:**  $E = mc^2$

**Latent Heat of Vaporization:**  $Q = m\Delta H_{vap}$

## Constants

**Volume of Ideal Gas at STP:**  $22.4 \frac{\text{L}}{\text{mol}}$

**Speed of Light in a Vacuum:**  $c = 3.00 \times 10^8 \frac{\text{m}}{\text{s}}$

**Specific Heat of Water:**  $c_p(\text{H}_2\text{O}) = 1.00 \frac{\text{cal}}{(\text{g}^\circ\text{C})} = 4.18 \frac{\text{J}}{(\text{g}^\circ\text{C})}$

**Latent Heat of Fusion of Water:**  $\Delta H_{fus}(\text{H}_2\text{O}) = 80 \frac{\text{cal}}{\text{g}} = 334 \frac{\text{J}}{\text{g}}$

**Latent Heat of Vaporization of Water:**  $\Delta H_{vap}(\text{H}_2\text{O}) = 540 \frac{\text{cal}}{\text{g}} = 2260 \frac{\text{J}}{\text{g}}$

## Unit Conversions

**Calorie-Joule Conversion:** |  $\text{cal} = 4.184 \text{ J}$

**Absolute Temperature Conversion:**  $\text{K} = ^\circ\text{C} + 273$

**Pressure Conversions:** |  $\text{atm} = 760 \text{ mm Hg} = 760 \text{ Torr} = 101.325 \text{ kPa} = 14.7 \frac{\text{lbs}}{\text{in}^2} = 29.92 \text{ in. Hg}$