FORMULAS

Description	Formula
Gibbs free energy equation	$\Delta G = \Delta H - T\Delta S$
Nernst equation	$E = E° - \left(\frac{0.0592\ \text{V}}{n}\right) \log Q$ at 298 K
Relationship between emf and free energy change for reactants and products in their standard states	$\Delta G° = -nFE°$
Energy change as an electron transitions between energy states	$\Delta E = R_{\text{H}} hc\left(\frac{1}{n_{\text{i}}^2} - \frac{1}{n_{\text{f}}^2}\right)$
Henderson-Hasselbalch equation	$\text{pH} = \text{p}K_a + \log\left(\frac{[\text{conjugate base}]}{[\text{acid}]}\right)$
Coulombs (C)	C = amperes × seconds
Photon energy	$E = h\nu$
Speed of light	$c = \lambda\nu$
Amount of heat (q)	$q = ms\Delta T$
Root-mean-square speed	$u_{\text{rms}} = \sqrt{\frac{3RT}{M}}$
Graham's law of diffusion	$\frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}}$

CONSTANTS

Description	Value
Ideal gas constant (R)	0.0821 L·atm/mol·K = 8.31 J/mol·K
Faraday constant (F)	9.65×10^4 C/mol e^- = 9.65×10^4 J/V·mol e^-
Rydberg constant (R_H)	1.097×10^7 m^{-1}
Boltzmann constant (k)	1.38×10^{-23} J/K
Planck's constant (h)	6.63×10^{-34} J·s
Molal freezing point depression constant for water (K_f)	1.86°C/m
Molal boiling point elevation constant for water (K_b)	0.51°C/m
Heat of fusion of water (ΔH_{fus})	334 J/g = 80 cal/g = 6.01 kJ/mol
Heat of vaporization of water (ΔH_{vap})	2260 J/g = 540 cal/g = 40.7 kJ/mol
Specific heat (s) of water (liquid)	4.18 J/g·K = 4.18 J/g·°C = 1.0 cal/g·°C
Dissociation constant of water (K_w)	1.0×10^{-14} at 25°C
Standard atmospheric pressure (STP)	1 atm = 760 mm Hg = 760 torr = 101.325 kPa
Speed of light in a vacuum (c)	3.00×10^8 m/s
1 calorie (cal)	4.184 J
1 watt (W)	1 J/s