CHEMISTRY FORMULA SHEET

Dilution	$M_1V_1 = M_2V_2$
Energy of a photon	$E_{photon} = hf$ = hc/y
Pressure	$P = F/A$
Average Kinetic Energy	$KE_{avg} = \frac{3}{2}RT$
Ideal Gas Law	$PV = nR$T
Combined Gas Law	$\frac{P_1V_1}{N_1T_1} = \frac{P_2V_2}{N_2T_2}$
Dalton's Law of Partial Pressures	$P_{total} = P_A + P_B + \ldots\ldots$
Dalton's Law of Partial Pressures	$P_A = \chi A\ P_{total}$
Graham's Law of Effusion	$\frac{r_1}{r_2} = \sqrt{\frac{M_{m2}}{M_{m1}}}$
Henry's Law	$P_A = k_H[A]$
Freezing Point Depression	$\Delta T_F = -iK_F M$
Boiling Point Elevation	$\Delta T_B = iK_B m$
Vapor Pressure Depression (Raoult's Law)	$P_{soln} = \chi_{solv} P^0_{solv}$
Osmotic Pressure (π)	$\pi = iMRT$
Arrhenius Equation	$k = Ae^{-ea/RT}$
Equilibrium Constant Expressions	$K_c = \frac{[products]}{[reactants]}$
Equilibrium Constant Expressions	$K_{eq} = \frac{k_{forward}}{k_{reverse}}$
Equilibrium Constant Expressions	$K_P = \frac{P_{products}}{P_{reactant}}$
Reaction Quotient (Q)	$Q = \frac{[produdcts]}{[reactants]}$
Solubility Product Constant (K_{sp})	$K_{sp} = \frac{[products]}{[reactants]}$
pH & pOH	$pH = -\log[H^+]$
pH & pOH	$pOH = -\log[OH^-]$
pH & pOH	$pH + pOH = 14$
pK_a & pK_b	$pK_a = -\log[K_a]$
pK_a & pK_b	$pK_b = -\log[K_b]$
pK_a & pK_b	$pK_a + pK_b = 14$
Neutralization Reaction	$n_AM_AV_A = n_BM_BV_B$
Buffers	$pH = pKa + \log[A^-]\ [HA]$
Enthalpy of Formation	$\Delta H_f = \Sigma n\Delta H^\circ_f(product) - \Sigma n\Delta H^\circ_f(reactants)$
First Law of Thermodynamics	$\Delta E = q + w$
Pressure Volume Work	$w = -P\Delta V$
Calorimetry Thermal Energy (q)	$q = -C_{calorimeter}\Delta T$
Heat Curves & Thermal Energy (q)	$q = mc\Delta T$
Heat Curves & Thermal Energy (q)	$q = m\Delta H_{fusion}$
Heat Curves & Thermal Energy (q)	$q = m\Delta H_{vaporization}$
Entropy (S)	$\Delta S = \Sigma nS_{products} - \Sigma nS_{reactants}$
Bond Dissociation Energy	$\Delta H = \Sigma\Delta H_{reactants} - \Sigma\Delta H_{products}$
Gibb's Free Energy (ΔG)	$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$
Gibb's Free Energy (ΔG)	$\Delta G = \Delta G^\circ + RTlnQ$
Gibb's Free Energy (ΔG)	$\Delta G^\circ = -RT*ln(K_{eq})$
Standard Cell Potential	$E^\circ = E^\circ reduction + E^\circ oxidation$
Standard Cell Potential	$E^\circ = E^\circ cathode + E^\circ anode$
Nernst Equation	$E_{cell} = E^\circ - \frac{0.0592}{n}$ logQ
Kinetics (always 1st order)	$N = N_0{}^{e\,-kt}$
Kinetics (always 1st order)	$\ln N = \ln N_0 - kt$
Kinetics (always 1st order)	$t_{1/2} = \frac{0.693}{k}$
Nuclear Binding Energy	$E = \Delta mc^2$