EQUATIONS NOT FOUND ON THE EQUATION SHEET FOR AP CHEMISTRY

Atomic Structure –

1 m = 1 x 10^9 nm

Effective nuclear charge –

Zeff (which electron) = # protons – inner core electrons

relative weighted average atomic mass = Σ(isotopic mass · fractional abundance)

Equilibrium –

$K_{sp} = [A^+]\,[B^-]$ where $AB(s) \rightleftharpoons A^+(aq) + B^-(aq)$

$$\% \text{ ionization} = \frac{[x]}{[acid\ or\ base]} \times 100$$

Kinetics –

Rate law = $k[A]^m[B]^n$

$k = Ae^{-E_a/RT}$ (qualitative understanding that E_a is independent of T)

Gases, Liquids, and Solutions –

Coulomb's Law – (all attractive forces)

Energy or force of attraction α charge/distance

Formal charge = # valence electrons – (#lone electrons + ½ shared electrons)

Dilution – $M_1V_1 = M_2V_2$

Thermodynamics and Electrochemistry –

$\Delta H^\circ_{rxn} = \Sigma_{\text{bonds broken}} - \Sigma_{\text{bonds formed}}$

$q_{\text{hot metal}} = - q_{\text{cold water}}$

$q_{\text{hot water}} = - q_{\text{cold water}}$

$q_{\text{dissolution}} = -(q_{\text{solution}} + q_{\text{calorimeter}})$

$q_{\text{reaction}} = - q_{\text{solution}}$

$E^\circ_{\text{cell}} = E^\circ_{\text{cathode}} - E^\circ_{\text{anode}}$

Amp = coulomb/s

Other –

$$\% \text{ yield} = \frac{actual}{theoretical} \times 100 \qquad \% \text{ error} = \frac{actual - theoretical}{theoretical} \times 100$$

equation for straight line – used for variety of plots – y = mx + b

$$\% \text{ mass} = \frac{g\ \ part}{total\ \ mass} \times 100$$