

Useful and Necessary Formulas

http://www2.ucdsb.on.ca/tiss/stretton/Database/formulas_content.html

1. Electromagnetic Radiation

- a) Speed of Light $c = \lambda \cdot \nu$
- b) Wavelength $\lambda = c / \nu$
- c) Frequency $\nu = c / \lambda$
- d) Energy in a photon $E = h \cdot \nu$

2. Concentration and Molar Mass

- a) Density (D) $D = m / V$
- b) Moles (n) $n = g / mm$
- c) Moles (# of particles) $n = \text{number of particles} / \text{Avogadro's number}$
- d) Moles (solution) $n = \text{concentration} \cdot \text{volume}$
- e) Moles (gas equation) $n = PV / RT$
- f) Molarity (M) $M = n / \text{volume}$
- g) Molar mass (mm) $mm = m / n$

3. Gases

- a) Boyle's Law $P_1 \cdot V_1 = P_2 \cdot V_2$
- b) Charles' Law $V_1 \cdot T_2 = V_2 \cdot T_1$
- c) Combined Gas Law $P_1 \cdot V_1 / T_1 = P_2 \cdot V_2 / T_2$
- d) Ideal Gas Law $PV = nRT$
- e) Dalton's Law of Partial Pressures $P_T = P_1 + P_2 + P_3 + \dots + P_n$

4. Acids and Bases

- a) pH $pH = -\log[H^{+1}]$
- b) pOH $pOH = -\log[OH^{-1}]$
- c) $[H_3O^{+1}]$ $[H_3O^{+1}] = 10^{-pH}$
- d) $[OH^{-1}]$ $[OH^{-1}] = 10^{-pOH}$

5. Heat

- a) Quantity of Heat (Q) $Q = m \cdot c \cdot \Delta t$
- b) Quantity of Heat (fusion) $Q = m \cdot L_f$
- c) Quantity of Heat (vaporization) $Q = m \cdot L_v$
- d) Celsius to Kelvin $K = ^\circ C + 273.15$
- e) Kelvin to Celcius $^\circ C = K - 273.15$

6. Mathematics

- a) Quadratic Equation $x = \frac{-b \pm (b^2 - 4ac)^{-2}}{2a}$