CHAPTER 2

Force and Weight: $F = ma/g_c$, $W = mg/g_c$

Standard Acceleration of Gravity:

g = 9.80665 m/s^2 = 980.665 cm/s^2 = 32.174 ft/s^2

g_c (gravitational conversion factor) = 1 kg·m·s^{-2}/N = 32.174 lb$_m$·ft·s^{-2}/lb$_f$ = 980.665 g$_m$·cm·s^{-2}/g$_f$

Two Point Linear Interpolation: $y = y_1 + \frac{x - x_1}{x_2 - x_1}(y_2 - y_1)$

Fitting a Straight line: y = ax+b, SLOPE, a = $\frac{y_2 - y_1}{x_2 - x_1}$, INTERCEPT, $b \begin{cases} = y_1 - ax_1 \\ = y_2 - ax_2 \end{cases}$

Method of Least Squares:

$$s_x = \frac{1}{n}\sum_{i=1}^{n} x_i \qquad s_{xx} = \frac{1}{n}\sum_{i=1}^{n} x_i^2$$

$$s_y = \frac{1}{n}\sum_{i=1}^{n} y_i \qquad s_{xy} = \frac{1}{n}\sum_{i=1}^{n} x_i y_i$$

SLOPE = $\frac{s_{xy} - s_x s_y}{s_{xx} - (s_x)^2}$, INTERCEPT = $\frac{s_{xx} s_y - s_{xy} s_x}{s_{xx} - (s_x)^2}$

CHAPTER 3

SG = ρ/ρ_{ref}

$\rho_{ref\ (H2O,4°C)}$ = 1.000 g/cm^3 = 1000 kg/m^3 = 62.43 lb$_m$/ft^3

Mass Fraction: $x_i = \frac{\text{mass of A}}{\text{total mass}}$, Mole Fraction: $y_i = \frac{\text{mole of A}}{\text{total mole}}$

Average Molecular Weight: $\overline{M} = \frac{m_t}{n_t} = \frac{total\ mass\ of\ sample}{total\ moles\ in\ sample}$

$$\overline{M} = y_1 M_1 + y_2 M_2 + \quad \therefore \cdots = \sum_{all\ components} y_i M_i$$

$$\frac{1}{\overline{M}} = \frac{x_1}{M_1} + \frac{x_2}{M_2} + \quad \therefore \cdots = \sum_{all\ components} \frac{x_i}{M_i}$$

Pressure: Hydrostatic Pressure: $P = P_o + \rho\frac{g}{g_c}h$

Head of Fluid: $P_h(head\ of\ fluid) = h_{head\ of\ fluid}$

$P_{absolute} = P_{gauge} + P_{atmospheric}$

General Manometer Equation: $P_1 + \rho_1\frac{g}{g_c}d_1 = P_2 + \rho_2\frac{g}{g_c}d_2 + \rho_f\frac{g}{g_c}h$

Differential Manometer Equation.: $P_1 - P_2 = (\rho_f - \rho)\frac{g}{g_c}h$

Manometer Formula for Gases: $P_1 - P_2 = h$

Temperature: T(K)=T(°C)+273.15, T(°R)=T(°F)+459.67, T(°R)=1.8T(K), T(°F)=1.8T(°C)+32

1 ΔK = 1 ΔºC = 1.8 ΔºR = 1.8 ΔºF