

Equations and Constants

$$\text{Molarity} = \frac{n}{V}$$

$$E_K = \frac{1}{2}mv^2 \quad E_K = \frac{3RT}{N_A}$$

$$E_p = mgh$$

$$E_{el} = V(\text{voltage}) = \frac{\kappa Q_1 Q_2}{d}$$

$$\Delta E = q + w$$

$$w = F \times d = F \times \Delta x$$

$$w = -P\Delta V$$

$$\Delta H = \Delta E + P\Delta V$$

$$q_{cal} = C\Delta T = mC_s\Delta T$$

$$\Delta H_{rxn}^{\circ} = \sum_{products} \Delta H_f^{\circ} - \sum_{reactants} \Delta H_f^{\circ}$$

$$PV = nRT$$

$$d = \frac{PM}{RT}$$

$$P_T = P_1 + P_2 + P_3 + P_4 + \dots$$

$$P_1 = \frac{n_1}{n_T} P_T = \chi_1 P_T$$

$$u_{rms} = \sqrt{\frac{3RT}{M}} \quad u_{mp} = \sqrt{\frac{2RT}{M}}$$

$$R = 0.08206 \frac{\text{L atm}}{\text{mol K}} = 8.314 \frac{\text{J}}{\text{mol K}}$$

$$= 1.987 \frac{\text{cal}}{\text{mol K}} = 8.314 \frac{\text{m}^3 \text{Pa}}{\text{mol K}}$$

$$= 62.36 \frac{\text{L torr}}{\text{mol K}}$$

$$101.325 \text{ J} = 1 \text{ L} \cdot \text{atm}$$

$$1 \text{ atm} = 760. \text{ mmHg} = 760. \text{ torr}$$

$$= 1.01325 \times 10^5 \text{ Pa}$$

$$1 \text{ atm} = 101.325 \text{ kPa} = 1.01325 \text{ bar}$$

$$1 \text{ L} = 1.0567 \text{ qt} = 0.2642 \text{ gal}$$

$$1 \text{ kg} = 2.2046 \text{ lb}$$

$$1 \text{ amu} = 1.6605 \times 10^{-27} \text{ kg}$$

$$\text{K} = ^{\circ}\text{C} + 273.15$$

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

$$1 \text{ km} = 0.62137 \text{ mi}$$

$$1 \text{ cal} = 4.184 \text{ J}$$

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

$$\kappa = 8.99 \times 10^9 \text{ J m C}^2$$

$$e = 1.602 \times 10^{-19} \text{ C}$$

$$g = 9.81 \text{ m/s}^2$$

$$1 \text{ \AA} = 1 \times 10^{-10} \text{ m}$$

