Formulae and Possibly Useful Information

1 inch = 2.54 cm (*exactly)*

1 mile = 5280 feet

1 kg = 2.2046 lb

1 calorie = 4.184 Joule

$c = 2.99792458 \times 10^{8}$ m/s

$h = 6.62606876 \times 10^{-34}$ J-s

$N_o = 6.02214199 \times 10^{23}$ mol^{-1}

mass $e^- = 5.48579911 \times 10^{-4}$ amu

mass n^o = 1.00866492 amu

$R_H = 2.1798741 \times 10^{-18}$ J

$K = {}^oC + 273.15$

density = mass/volume = PM/RT

$PV = nRT$

$r_1/r_2 = \sqrt{(M_2/M_1)}$

$E_k = (3/2)\,PV = (3/2)\,nRT$

$(P + an^2/V^2)(V - nb) = nRT$

$\Delta E = q + w$ $\quad w = -P\Delta V$ $\quad q = mc_s\Delta T$ $\quad q_{rxn} = -C_{cal}\Delta T$

$\Delta H = q_p$ $\quad \Delta H^0_{rxn} = \Sigma\, n\Delta H^o_f(\text{products}) - \Sigma\, n\Delta H^o_f(\text{reactants})$

$E = h\nu$ $\quad E = hc/\lambda$ $\quad c = \lambda\nu$ $\quad \lambda = h/mv$

$E = -R_H(1/n^2)$ $\quad \Delta E = R_H(1/(n_i)^2 - 1/(n_f)^2)$

1 m^3 = 1000 L

1 cm^3 = 1 mL

1 atm = 760 torr = 760 mm Hg

1 atm = 101,325 Pa

R = 0.08206 L-atm/mol-K = 8.3145 J/mol-K

$\pi = 3.1415927$

1 amu = $1.66053873 \times 10^{-24}$ g

mass p^+ = 1.00727646 amu

$k_B = 1.38066 \times 10^{-23}$ J/K

$^oF = (9/5)^oC + 32$ (*exactly)*

$P = F/A$

$u_{rms} = \sqrt{(3RT/M)}$

$X_i = n_i/n_{tot} = P_i/P_{tot}$

$\langle\varepsilon_k\rangle = \frac{1}{2}mv^2 = (3/2)k_BT$

$P = nRT/(V - nb) - an^2/V^2$