SOME USEFUL CONSTANTS

(a more complete list appears in Appendix B)

Atomic mass unit	$1 \text{ amu} = 1.6606 \times 10^{-24}$ g
Avogadro's number	$N = 6.02214179 \times 10^{23}$ particles/mol
Electronic charge	$e = 1.60218 \times 10^{-19}$ coulombs
Faraday constant	$F = 96{,}485.3399$ coulombs/mol e^-
Gas constant	$R = 0.08206 \dfrac{\text{L atm}}{\text{mol K}} = 1.987 \dfrac{\text{cal}}{\text{mol K}}$
	$= 8.314472 \dfrac{\text{J}}{\text{mol K}} = 8.314472 \dfrac{\text{kPa dm}^3}{\text{mol K}}$
Pi	$\pi = 3.1415927$
Planck's constant	$h = 6.62606896 \times 10^{-34}$ J s
Speed of light (in vacuum)	$c = 2.99792458 \times 10^{8}$ m/s

SOME USEFUL RELATIONSHIPS

Mass and Weight

SI Base Unit: Kilogram (kg)

1 kilogram = 1000 grams = 2.205 pounds
1 gram = 1000 milligrams
1 pound = 453.59 grams
1 amu = 1.6606×10^{-24} grams
1 gram = 6.022×10^{23} amu
1 ton = 2000 pounds

Volume

SI Base Unit: Cubic Meter (m^3)

1 liter = 0.001 cubic meter
1 liter = 1000 cubic centimeters = 1000 mL
1 liter = 1.056 quarts
1 quart = 0.9463 liter
1 milliliter = 0.001 liter = 1 cubic centimeter
cubic foot = 7.475 gallons = 28.316 liters
1 gallon = 4 quarts

Pressure

SI Base Unit: Pascal (Pa)

$1 \text{ pascal} = \dfrac{\text{kg}}{\text{m s}^2} = 1 \text{ Newton/m}^2$
1 atmosphere = 760 torr
= 760 millimeters of mercury
= 1.01325×10^5 pascals
= 1.01325 bar
= 14.70 pounds per square inch
1 torr = 1 millimeter of mercury

Length

SI Base Unit: Meter (m)

1 inch = 2.54 centimeters (exactly)
1 meter = 100 centimeters = 39.37 inches
1 yard = 0.9144 meter
1 mile = 1.609 kilometers
1 kilometer = 1000 meters = 0.6215 mile
1 Ångstrom = 1.0×10^{-10} meters = 1.0×10^{-8} centimeters

Energy

SI Base Unit: Joule (J)

1 calorie = 4.184 joules = 4.129×10^{-2} L atm
$1 \text{ joule} = 1 \dfrac{\text{kg m}^2}{\text{s}^2} = 0.23901 \text{ calorie}$
1 joule = 1×10^7 ergs
1 electron volt = 1.6022×10^{-19} joule
1 electron volt = 96.485 kJ/mol
1 L atm = 24.217 calories = 101.325 joules

Temperature

SI Base Unit: Kelvin (K)

0 K = −273.15°C
K = °C + 273.15°
°F = 1.8(°C) + 32°
$°\text{C} = \dfrac{°\text{F} - 32°}{1.8°}$