

Selected Fundamental Constants and Conversion Factors

Values of selected fundamental constants

Speed of light in a vacuum (c)	$c = 2.99792458 \times 10^8 \text{ m/s}$
Charge on an electron (e)	$e = 1.6021892 \times 10^{-19} \text{ C}$
Rest mass of an electron (m_e)	$m_e = 9.109534 \times 10^{-28} \text{ g}$ $= 5.4858026 \times 10^{-4} \text{ amu}$
Rest mass of a proton (m_p)	$m_p = 1.6726485 \times 10^{-24} \text{ g}$ $= 1.00727647 \text{ amu}$
Rest mass of a neutron (m_n)	$m_n = 1.6749543 \times 10^{-24} \text{ g}$ $= 1.008665012 \text{ amu}$
Faraday's constant (F)	$F = 96,484.56 \text{ C/mol}$
Planck's constant (h)	$h = 6.626176 \times 10^{-34} \text{ J-s}$
Ideal gas constant (R)	$R = 0.0820568 \text{ L-atm/mol-K}$ $= 8.31441 \text{ J/mol-K}$
Atomic mass unit (amu)	$1 \text{ amu} = 1.6605655 \times 10^{-24} \text{ g}$
Boltzmann's constant (k)	$k = 1.380662 \times 10^{-23} \text{ J/K}$
Avogadro's constant (N)	$N = 6.022045 \times 10^{23} \text{ mol}^{-1}$
Rydberg constant (R_H)	$R_H = 1.09737318 \times 10^7 \text{ m}^{-1}$
Heat capacity of water	$C = 75.376 \text{ J/mol-K}$

Selected conversion factors

Energy	$1 \text{ J} = 0.2390 \text{ cal} = 10^7 \text{ erg}$ $1 \text{ cal} = 4.184 \text{ J (by definition)}$ $1 \text{ eV} = 1.6021892 \times 10^{-19} \text{ J}$
Temperature	$\text{K} = ^\circ\text{C} + 273.15$ $^\circ\text{C} = 5/9 (^\circ\text{F} - 32)$ $^\circ\text{F} = 9/5 (^\circ\text{C}) + 32$
Pressure	$1 \text{ atm} = 760 \text{ mmHg} = 760 \text{ torr} = 101.325 \text{ kPa}$
Mass	$1 \text{ kg} = 2.2046 \text{ lb}$ $1 \text{ lb} = 453.59 \text{ g} = 0.45359 \text{ kg}$ $1 \text{ oz} = 0.06250 \text{ lb} = 28.350 \text{ g}$ $1 \text{ ton} = 2000 \text{ lb} = 907.185 \text{ kg}$ $1 \text{ tonne (metric)} = 1000 \text{ kg} = 2204.62 \text{ lb}$
Volume	$1 \text{ mL} = 0.001 \text{ L} = 1 \text{ cm}^3 \text{ (by definition)}$ $1 \text{ oz (fluid)} = 0.031250 \text{ qt} = 0.029573 \text{ L}$ $1 \text{ qt} = 0.946326 \text{ L}$ $1 \text{ L} = 1.05672 \text{ qt}$
Length	$1 \text{ m} = 39.370 \text{ in}$ $1 \text{ mi} = 1.60934 \text{ km}$ $1 \text{ in} = 2.540 \text{ cm (by definition)}$