

Selected Physical Constants

Accurate updated values are listed. When doing numerical problems use only a reasonable number of significant figures (usually 3 or 4).

atomic mass constant $u = 1.66053873 \times 10^{-27}$ kg

Avogadro constant $N_A = 6.02214199 \times 10^{23}$ mol⁻¹

Bohr magneton $\mu_B = 9.27400899 \times 10^{-24}$ J T⁻¹

Bohr radius $a_0 = 0.5291772083 \times 10^{-10}$ m

Boltzmann constant $k = 1.3806503 \times 10^{-23}$ J K⁻¹

Compton wavelength $h/m_e c = 2.426310215 \times 10^{-12}$ m

electric constant $\epsilon_0 = 8.854187817 \times 10^{-12}$ F m⁻¹

electron mass $m_e = 9.10938188 \times 10^{-31}$ kg

electron volt $eV = 1.602176462 \times 10^{-19}$ J

elementary charge $e = 1.602176462 \times 10^{-19}$ C

fine-structure constant $\alpha = 7.297352533 \times 10^{-3}$

$$\alpha^{-1} = 137.03599976$$

Hartree energy $E_h = 4.35974381 \times 10^{-18}$ J = 27.2113834 eV

magnetic constant $\mu_0 = 4\pi \times 10^{-7}$ NA⁻²

molar gas constant $R = 8.314472$ J mol⁻¹ K⁻¹

Newtonian constant of gravitation $G = 6.673 \times 10^{-11}$ m³ kg⁻¹ s⁻²

nuclear magneton $\mu_N = 5.05078317 \times 10^{-27}$ J T⁻¹

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

$$\hbar = 1.054571596 \times 10^{-34}$$
 J s

proton mass $m_p = 1.67262158 \times 10^{-27}$ kg

proton-electron mass ratio $m_p/m_e = 1836.1526675$

Rydberg constant $R_\infty = 10973731.568549$ m⁻¹

second radiation constant $hc/k = 1.4387752 \times 10^{-2}$ m K

speed of light in vacuum $c = 2.99792458 \times 10^8$ m⁻¹