

Fundamental Physical Constants — Frequently used constants

| Quantity | Symbol | Value | Unit | Relative std. uncert. u_r |
|---|---------------|---|---|-----------------------------|
| speed of light in vacuum | c, c_0 | 299 792 458 | m s^{-1} | exact |
| magnetic constant | μ_0 | $4\pi \times 10^{-7}$ $= 12.566 370 614... \times 10^{-7}$ | N A^{-2} N A^{-2} | exact |
| electric constant $1/\mu_0 c^2$ | ϵ_0 | $8.854 187 817... \times 10^{-12}$ | F m^{-1} | exact |
| Newtonian constant of gravitation | G | $6.673 84(80) \times 10^{-11}$ | $\text{m}^3 \text{kg}^{-1} \text{s}^{-2}$ | 1.2×10^{-4} |
| Planck constant | h | $6.626 069 57(29) \times 10^{-34}$ | J s | 4.4×10^{-8} |
| $h/2\pi$ | \hbar | $1.054 571 726(47) \times 10^{-34}$ | J s | 4.4×10^{-8} |
| elementary charge | e | $1.602 176 565(35) \times 10^{-19}$ | C | 2.2×10^{-8} |
| magnetic flux quantum $h/2e$ | Φ_0 | $2.067 833 758(46) \times 10^{-15}$ | Wb | 2.2×10^{-8} |
| conductance quantum $2e^2/h$ | G_0 | $7.748 091 7346(25) \times 10^{-5}$ | S | 3.2×10^{-10} |
| electron mass | m_e | $9.109 382 91(40) \times 10^{-31}$ | kg | 4.4×10^{-8} |
| proton mass | m_p | $1.672 621 777(74) \times 10^{-27}$ | kg | 4.4×10^{-8} |
| proton-electron mass ratio | m_p/m_e | 1836.152 672 45(75) | | 4.1×10^{-10} |
| fine-structure constant $e^2/4\pi\epsilon_0\hbar c$ | α | $7.297 352 5698(24) \times 10^{-3}$ | | 3.2×10^{-10} |
| inverse fine-structure constant | α^{-1} | 137.035 999 074(44) | | 3.2×10^{-10} |
| Rydberg constant $\alpha^2 m_e c/2h$ | R_∞ | 10 973 731.568 539(55) | m^{-1} | 5.0×10^{-12} |
| Avogadro constant | N_A, L | $6.022 141 29(27) \times 10^{23}$ | mol^{-1} | 4.4×10^{-8} |
| Faraday constant $N_A e$ | F | 96 485.3365(21) | C mol^{-1} | 2.2×10^{-8} |
| molar gas constant | R | 8.314 4621(75) | $\text{J mol}^{-1} \text{K}^{-1}$ | 9.1×10^{-7} |
| Boltzmann constant R/N_A | k | $1.380 6488(13) \times 10^{-23}$ | J K^{-1} | 9.1×10^{-7} |
| Stefan-Boltzmann constant $(\pi^2/60)k^4/\hbar^3 c^2$ | σ | $5.670 373(21) \times 10^{-8}$ | $\text{W m}^{-2} \text{K}^{-4}$ | 3.6×10^{-6} |
| Non-SI units accepted for use with the SI | | | | |
| electron volt (e/C) J | eV | $1.602 176 565(35) \times 10^{-19}$ | J | 2.2×10^{-8} |
| (unified) atomic mass unit $\frac{1}{12}m(^{12}\text{C})$ | u | $1.660 538 921(73) \times 10^{-27}$ | kg | 4.4×10^{-8} |

P. J. Mohr, B. N. Taylor, and D. B. Newell (2011),

"The 2010 CODATA Recommended Values of the Fundamental Physical Constants"

(Web Version 6.0). This database was developed by J. Baker, M. Douma, and S. Kotochigova.

Available: <http://physics.nist.gov/constants>

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