

Fundamental Physical Constants — Non-SI units

Quantity	Symbol	Value	Unit	Relative std. uncert. u_r
Non-SI units accepted for use with the SI				
electron volt: (e/C) J	eV	$1.602\,176\,634 \times 10^{-19}$	J	exact
(unified) atomic mass unit: $\frac{1}{12}m(^{12}\text{C})$	u	$1.660\,539\,066\,60(50) \times 10^{-27}$	kg	3.0×10^{-10}
Natural units (n.u.)				
n.u. of velocity	c	299 792 458	m s^{-1}	exact
n.u. of action	\hbar	$1.054\,571\,817 \dots \times 10^{-34}$	J s	exact
		$6.582\,119\,569 \dots \times 10^{-16}$	eV s	exact
n.u. of mass	m_e	$9.109\,383\,7015(28) \times 10^{-31}$	kg	3.0×10^{-10}
		$0.510\,998\,950\,00(15)$	MeV	3.0×10^{-10}
n.u. of energy	$m_e c^2$	$8.187\,105\,7769(25) \times 10^{-14}$	J	3.0×10^{-10}
		$0.510\,998\,950\,00(15)$	MeV	3.0×10^{-10}
n.u. of momentum	$m_e c$	$2.730\,924\,530\,75(82) \times 10^{-22}$	kg m s^{-1}	3.0×10^{-10}
		$0.510\,998\,950\,00(15)$	MeV/c	3.0×10^{-10}
n.u. of length: $\hbar/m_e c$	λ_C	$3.861\,592\,6796(12) \times 10^{-13}$	m	3.0×10^{-10}
n.u. of time	$\hbar/m_e c^2$	$1.288\,088\,668\,19(39) \times 10^{-21}$	s	3.0×10^{-10}
Atomic units (a.u.)				
a.u. of charge	e	$1.602\,176\,634 \times 10^{-19}$	C	exact
a.u. of mass	m_e	$9.109\,383\,7015(28) \times 10^{-31}$	kg	3.0×10^{-10}
a.u. of action	\hbar	$1.054\,571\,817 \dots \times 10^{-34}$	J s	exact
a.u. of length: Bohr radius (bohr)	a_0	$5.291\,772\,109\,03(80) \times 10^{-11}$	m	1.5×10^{-10}
$\hbar/\alpha m_e c$				
a.u. of energy: Hartree energy (hartree)	E_h	$4.359\,744\,722\,2071(85) \times 10^{-18}$	J	1.9×10^{-12}
$\alpha^2 m_e c^2 = e^2/4\pi\epsilon_0 a_0 = 2hc R_\infty$				
a.u. of time	\hbar/E_h	$2.418\,884\,326\,5857(47) \times 10^{-17}$	s	1.9×10^{-12}
a.u. of force	E_h/a_0	$8.238\,723\,4983(12) \times 10^{-8}$	N	1.5×10^{-10}
a.u. of velocity: αc	$a_0 E_h/\hbar$	$2.187\,691\,263\,64(33) \times 10^6$	m s^{-1}	1.5×10^{-10}
a.u. of momentum	\hbar/a_0	$1.992\,851\,914\,10(30) \times 10^{-24}$	kg m s^{-1}	1.5×10^{-10}
a.u. of current	$e E_h/\hbar$	$6.623\,618\,237\,510(13) \times 10^{-3}$	A	1.9×10^{-12}
a.u. of charge density	e/a_0^3	$1.081\,202\,384\,57(49) \times 10^{12}$	C m^{-3}	4.5×10^{-10}
a.u. of electric potential	E_h/e	27.211 386 245 988(53)	V	1.9×10^{-12}
a.u. of electric field	E_h/ea_0	$5.142\,206\,747\,63(78) \times 10^{11}$	V m^{-1}	1.5×10^{-10}
a.u. of electric field gradient	E_h/ea_0^2	$9.717\,362\,4292(29) \times 10^{21}$	V m^{-2}	3.0×10^{-10}
a.u. of electric dipole moment	ea_0	$8.478\,353\,6255(13) \times 10^{-30}$	C m	1.5×10^{-10}
a.u. of electric quadrupole moment	ea_0^2	$4.486\,551\,5246(14) \times 10^{-40}$	C m^2	3.0×10^{-10}
a.u. of electric polarizability	$e^2 a_0^2/E_h$	$1.648\,777\,274\,36(50) \times 10^{-41}$	$\text{C}^2 \text{m}^2 \text{J}^{-1}$	3.0×10^{-10}
a.u. of 1 st hyperpolarizability	$e^3 a_0^3/E_h^2$	$3.206\,361\,3061(15) \times 10^{-53}$	$\text{C}^3 \text{m}^3 \text{J}^{-2}$	4.5×10^{-10}
a.u. of 2 nd hyperpolarizability	$e^4 a_0^4/E_h^3$	$6.235\,379\,9905(38) \times 10^{-65}$	$\text{C}^4 \text{m}^4 \text{J}^{-3}$	6.0×10^{-10}
a.u. of magnetic flux density	\hbar/ea_0^2	$2.350\,517\,567\,58(71) \times 10^5$	T	3.0×10^{-10}
a.u. of magnetic dipole moment: $2\mu_B$	$\hbar e/m_e$	$1.854\,802\,015\,66(56) \times 10^{-23}$	J T^{-1}	3.0×10^{-10}
a.u. of magnetizability	$e^2 a_0^2/m_e$	$7.891\,036\,6008(48) \times 10^{-29}$	J T^{-2}	6.0×10^{-10}
a.u. of permittivity	$e^2/a_0 E_h$	$1.112\,650\,055\,45(17) \times 10^{-10}$	F m^{-1}	1.5×10^{-10}