

Physicochemical Constants

Quantity	Symbol	Value	Unit	Uncertainty
atomic mass unit	amu, u	$1.66053873 \times 10^{-27}$	kg	8 th DP
Avogadro constant	N_A, n_{Av}	$6.02214199 \times 10^{23}$	1/mol	8 th DP
Boltzmann constant	k, k_B	$1.3806503 \times 10^{-23}$	J/K	6 th DP
Coulomb constant	C	$6.24150974 \times 10^{18}$	e	8 th DP
dielectric constant	ϵ_0	$8.854187817 \times 10^{-12}$	F/m	exactly
elementary charge	e, q	$1.602176462 \times 10^{-19}$	C	8 th DP
elementary mass of a neutron	m_n	$1.67492716 \times 10^{-27}$	kg	8 th DP
elementary mass of a proton	m_p	$1.67262158 \times 10^{-27}$	kg	8 th DP
elementary mass of an electron	m_e	$9.10938188 \times 10^{-31}$	kg	8 th DP
Faraday constant	F	9.64853415×10^4	C/mol	8 th DP
gas constant	R	8.314472	J/mol·K	6 th DP
gas constant	R	0.08205746	L·atm/mol·K	8 th DP
Planck constant	h	$6.62606876 \times 10^{-34}$	J·s	8 th DP
Rydberg constant	R_∞	$1.0973731568549 \times 10^7$	1/m	12 th DP
speed of light	c	2.99792458×10^8	m/s	exactly
standard gravity	g_0	9.80665	m/s ²	exactly
π		3.14159265359		infinite precision
e		2.71828182846		infinite precision
$\ln(2)$		0.69314718056		infinite precision
$\ln(10)$		2.30258509299		infinite precision
Standard Temperature and Pressure	STP	0°C, 1 atm		exactly
molar volume of an ideal gas	V_m (STP)	22.41400	L	5 th DP
Standard Ambient Temperature and Pressure	SATP	25°C, 1 atm		exactly
molar volume of an ideal gas	V_m (SATP)	24.46543	L	5 th DP
Thermodynamic Standard State	TSS	25°C, 1 atm, 1 M		exactly
Nernst factor		0.05916	V	5 th DP

Conversion Factors					
From Value	From Unit		To Value	To Unit	Uncertainty
<i>Energy</i>					
1	cal	=	4.184	J	exactly
1	eV	=	$1.60217653 \times 10^{-19}$	J	8 th DP
1	L·atm	=	101.325	J	exactly
1	Btu	=	1055.05585	J	5 th DP
1	(dietary) Cal	=	1000	cal	exactly
<i>Length</i>					
1	mi	=	1760	yd	exactly
1	yd	=	3	ft	exactly
1	ft	=	12	in	exactly
1	in	=	2.54	cm	exactly
1	mi	=	1.609344	km	exactly
1	Å	=	1×10^{-10}	m	exactly
<i>Mass</i>					
1	ton	=	2000	lb	exactly
1	lb	=	16	oz	exactly
1	lb	=	453.59237	g	exactly
1	t	=	1000	kg	exactly
1	ct	=	0.200	g	exactly
<i>Pressure</i>					
1	atm	=	101325	Pa	exactly
1	atm	=	1.01325	bar	exactly
1	atm	=	760	mmHg	exactly
1	atm	=	760	torr	exactly
1	atm	=	14.69594878	psi	8 th DP
1	bar	=	1×10^5	Pa	exactly
1	Pa	=	1	N/m ²	exactly

Conversion Factors					
From Value	From Unit		To Value	To Unit	Uncertainty
<i>Radioactivity</i>					
1	Ci	=	3.70×10^{10}	Bq	exactly
1	Gy	=	1	J/kg	exactly
1	Gy	=	100	rad	exactly
1	R	=	2.58×10^{-4}	C/kg	exactly
1	Sv	=	100	rem	exactly
<i>Temperature</i>					
0	°C	=	273.15	K	exactly
100	°C	=	373.15	K	exactly
T _C	°C	=	T _C + 273.15	K	exactly
T _C	°C	=	$(^{\circ}/_5 \times T_C) + 32$	°F	exactly
T _F	°F	=	$(T_F - 32) \times ^5/_9$	°C	exactly
<i>Time</i>					
1	(calendar) yr	=	365	d	exactly
1	(solar) yr	=	365.242	d	3 rd DP
1	d	=	24	h	exactly
1	h	=	60	min	exactly
1	min	=	60	s	exactly
1	Hz	=	1	1/s	exactly
<i>Volume</i>					
1	gal	=	4	qt	exactly
1	qt	=	2	pt	exactly
1	pt	=	2	cup	exactly
1	pt	=	16	fl.oz.	exactly
1	fl.oz.	=	8	dram	exactly
1	gal	=	231	in ³	exactly
1	gal	=	3.785411784	L	exactly
1	cm ³	=	1	mL	exactly
1	m ³	=	1×10^3	L	exactly