

SI UNITS

Table A1-1. Base Units

Quantity	Name	Symbol
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
absolute temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

Table A1-2. Prefixes

Multiplication Factor	Name	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
$10^3 = 1000$	kilo	k
$10^2 = 100$	hecto	h
$10^1 = 10$	deka	da
$10^{-1} = 0.1$	deci	d
$10^{-2} = 0.01$	centi	c
$10^{-3} = 0.001$	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f

Table A1-3. Derived Units

Quantity	Name	Symbol	Expressed in Derived Units	Expressed in Base Units
angle, plane	radian	rad	---	$\text{m}\cdot\text{m}^{-1} = 1$
	degree	°	$(\pi/180)$ rad	$(\pi/180)$ $\text{m}\cdot\text{m}^{-1}$
	revolution	rev	(2π) rad	(2π) $\text{m}\cdot\text{m}^{-1}$
radioactivity (rate of nuclear decay)	becquerel	Bq	---	s^{-1}
concentration & molar density	molar	M	mol/L	kmol/m^3
	millimolar	mM	---	mol/m^3
electric charge	coulomb	C	---	$\text{s}\cdot\text{A}$
electric conductance	siemens	S	$\text{A}/\text{V}=1/\text{Ohm}$	$\text{m}^{-2}\cdot\text{kg}^{-1}\cdot\text{s}^3\cdot\text{A}^2$
electric potential	volt	V	W/A	$\text{m}^2\cdot\text{kg}\cdot\text{s}^{-3}\cdot\text{A}^{-1}$
electric resistance	ohm	Ω	V/A	$\text{m}^2\cdot\text{kg}\cdot\text{s}^{-3}\cdot\text{A}^{-2}$
energy, work, heat	joule	J	$\text{N}\cdot\text{m}$	$\text{m}^2\cdot\text{kg}\cdot\text{s}^{-2}$
force	newton	N	---	$\text{m}\cdot\text{kg}\cdot\text{s}^{-2}$
frequency	hertz	Hz	---	s^{-1}
molecular weight	daltons	Da	g/mol	kg/kmol
power	watt	W	J/s	$\text{m}^2\cdot\text{kg}\cdot\text{s}^{-3}$
pressure, stress	pascal	Pa	N/m^2	$\text{kg}\cdot\text{m}^{-1}\cdot\text{s}^{-2}$
volume	liter	L	---	10^{-3} m^3

Table A1-4. Conversion to SI Units From Other Commonly-Used Units

Quantity	Name	Symbol	Value in SI Units
distance	angström	Å	$\text{Å} = 0.1 \text{ nm} = 10^{-10} \text{ m}$
energy	erg	erg	$\text{erg} = 10^{-7} \text{ J}$
force	dyne	dyn	$\text{dyn} = 10^{-5} \text{ N}$
force	kilogram-force	kgf	$\text{kgf} = 9.80665 \text{ N}$
heat	calorie	cal	$\text{cal} = 4.148 \text{ J}$
pressure	standard atmosphere	atm	$\text{atm} = 101.325 \text{ kPa}$
pressure	millimeter of mercury	mmHg or torr	$\text{mmHg} = 133.3 \text{ Pa}$
viscosity	poise	P	$\text{P}=\text{dyn}\cdot\text{s}/\text{cm}^2 = 0.1 \text{ Pa}\cdot\text{s}$