

TOPIC 7 USEFUL TABLES AND DATA

7.1 The Periodic Table

[illegible]

Table 7.1 The Periodic Table.

7.2 The Greek alphabet

Table 7.2 The Greek alphabet.

Name	Lower case	Upper case	Name	Lower case	Upper case
Alpha	α	A	Nu (new)	ν	N
Beta (bee-ta)	β	B	Xi (cs-eye)	ξ	Ξ
Gamma	γ	Γ	Omicron	ο	O
Delta	δ	Δ	Pi (pie)	π	
Epsilon	ε	E	Rho (roe)	ρ	P
Zeta (zee-ta)	ζ	Z	Sigma	σ	Σ
Eta (ee-ta)	η	H	Tau	τ	T
Theta (thee-ta – ‘th’ as in theatre)	θ	Θ	Upsilon	υ	Υ
Iota (eye-owe-ta)	ι	I	Phi (fie)	φ	Φ
Kappa	κ	K	Chi (kie)	χ	X
Lambda (lam-da)	λ	Λ	Psi (ps-eye)	ψ	Ψ
Mu (mew)	μ	M	Omega (owe-me-ga)	ω	Ω

7.3 Selected physical constants and unit conversions

Table 7.3 SI fundamental and derived units.

Quantity	Unit	Abbreviation	Equivalent units
mass	kilogram	kg	
length	metre	m	
time	second	s	
temperature	kelvin	K	
angle	radian	rad	
area	square metre	m ²	
volume	cubic metre	m ³	
speed, velocity	metre per second	ms ⁻¹	
acceleration	metre per second squared	ms ⁻²	
density	kilogram per cubic metre	kgm ⁻³	
frequency	hertz	Hz	(cycles) s ⁻¹
force	newton	N	kgms ⁻²
pressure	pascal	Pa	kgm ⁻¹ s ⁻² , Nm ⁻²
energy	joule	J	kgm ² s ⁻²
power	watt	W	kgm ² s ⁻³ , Js ⁻¹
specific heat capacity	joule per kilogram kelvin	Jkg ⁻¹ K ⁻¹	m ² s ⁻² K ⁻¹
thermal conductivity	watt per metre kelvin	Wm ⁻¹ K ⁻¹	mkg s ⁻³ K ⁻¹

Table 7.4 Selected physical constants and preferred values.

Quantity	Symbol	Value
speed of light in a vacuum	c	$3.00 \times 10^8 \text{ m s}^{-1}$
Planck constant	h	$6.63 \times 10^{-34} \text{ J s}$
Boltzmann constant	k	$1.38 \times 10^{-23} \text{ J K}^{-1}$
gravitational constant	G	$6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
Stefan–Boltzmann constant	σ	$5.67 \times 10^{-8} \text{ W m}^2 \text{ K}^{-4}$
Avogadro constant	N_A	$6.02 \times 10^{23} \text{ mol}^{-1}$
molar gas constant	R	$8.31 \text{ J K}^{-1} \text{ mol}^{-1}$
charge of electron	e	$1.60 \times 10^{-19} \text{ C}$ (negative charge)
mass of proton	m_p	$1.67 \times 10^{-27} \text{ kg}$
mass of electron	m_e	$9.11 \times 10^{-31} \text{ kg}$
Astronomical quantities:		
mass of the Sun	M_\odot	$1.99 \times 10^{30} \text{ kg}$
radius of the Sun	R_\odot	$6.96 \times 10^8 \text{ m}$
photospheric temperature of the Sun	T_\odot	5770 K
luminosity of the Sun	L_\odot	$3.84 \times 10^{26} \text{ W}$
astronomical unit	AU	$1.50 \times 10^{11} \text{ m}$

Table 7.5 Some useful conversions from alternative unit systems to SI units.

Quantity	Unit	SI equivalent
angle	1 degree	$(\pi/180)$ radians
pressure	1 bar	10^5 pascals
temperature	1 °C	1 K
energy	1 erg	10^{-7} joules
	1 electron volt	$1.60 \times 10^{-19} \text{ J}$
	1 ton of TNT	$4.18 \times 10^9 \text{ J}$
length	1 foot	0.305 m
	1 mile	1.61 km
area	1 square inch	$6.45 \times 10^{-4} \text{ m}^2$
	1 square mile	$2.59 \times 10^6 \text{ m}^2$
mass	1 pound	0.454 kg
speed, velocity	1 mile per hour	0.447 m s^{-1}