



## Periodic Table and Data Sheet

### Physical Constants and Formulae

Avogadro's constant	$N_A$	$6.022 \times 10^{23} \text{ mol}^{-1}$
molar gas constant	$R$	$8.314 \text{ J K}^{-1} \text{ mol}^{-1}$
Faraday constant	$F$	$96485 \text{ C mol}^{-1}$
Planck constant	$h$	$6.626 \times 10^{-34} \text{ m}^2 \text{ kg s}^{-1}$
speed of light in vacuum	$c$	$2.998 \times 10^8 \text{ m s}^{-1}$
mass of electron	$m_e$	$9.109 \times 10^{-31} \text{ kg}$
atmospheric pressure	$p_{atm}$	101325 Pa

$$1 \text{ nm} = 1 \times 10^{-9} \text{ m}$$

$$1 \text{ \AA} = 1 \times 10^{-10} \text{ m}$$

$$1 \text{ pm} = 1 \times 10^{-12} \text{ m}$$

$$0 \text{ }^\circ\text{C} = 273 \text{ K}$$

Ideal gas equation	$pV = nRT$
Frequency of light, $\nu$	$\nu = \frac{c}{\lambda}$

### IR Absorption data

Bond	Wavenumber / $\text{cm}^{-1}$
N–H	3500-3350
O–H (alcohol)	3600-3200
O–H (acid)	3600-2500
C–H	3300-2840
$\text{C}\equiv\text{N}$	2250
$\text{C}\equiv\text{C}$	2260-2100
$\text{C}=\text{O}$	1780-1680
$\text{C}=\text{C}$	1680-1600
$\text{C}=\text{C}$ (conjugated)	1600-1400
C–O	1250-1050
C–C	1100-750

$$\text{volume of cube} = (\text{side length})^3$$

$$\text{volume of sphere} = \frac{4}{3}\pi \times (\text{radius})^3$$

## Periodic Table

1 H 1.008																	2 He 4.003
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.102	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.63	33 As 74.92	34 Se 78.97	35 Br 79.904	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.95	43 Tc	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57 La	72 Hf 178.49	73 Ta 180.95	74 W 183.84	75 Re 186.21	76 Os 190.23	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

Lanthanides	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm	62 Sm 150.4	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.05	71 Lu 174.97
Actinides	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr