

Periodic Table of the Elements

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1 H 1.01																	2 He 4.00
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 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 51.99	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 79.90	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 98.91	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 127.6	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57-71	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 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po [208.98]	85 At 209.99	86 Rn 222.02
87 Fr 223.02	88 Ra 226.03	89-103	104 Rf [261]	105 Db [262]	106 Sg [266]	107 Bh [264]	108 Hs [269]	109 Mt [278]	110 Ds [281]	111 Rg [280]	112 Cn [285]	113 Nh [286]	114 Fl [289]	115 Mc [289]	116 Lv [293]	117 Ts [294]	118 Og [294]
57 La 138.91		58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 144.91	62 Sm 150.36	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 173.06	71 Lu 174.97		
89 Ac 227.03		90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244.06	95 Am 243.06	96 Cm 247.07	97 Bk 247.07	98 Cf 251.08	99 Es [254]	100 Fm 257.10	101 Md 258.1	102 No 259.10	103 Lr [262]		

Fundamental Constants		
Avogadro's number	N_A	$6.02214 \times 10^{23} \frac{1}{mol}$
Gas constant	R	$8.3145 \frac{J}{mol \cdot K}$ $0.08206 \frac{L \cdot atm}{mol \cdot K}$
Faraday's constant	F	$96,485 \frac{C}{mol}$
Planck's constant	h	$6.62608 \times 10^{-34} J \cdot s$
Boltzmann's constant	K	$1.38066 \times 10^{-23} \frac{J}{K}$
Speed of light	c	$2.9979246 \times 10^8 \frac{m}{s}$
Electron's mass		$9.10939 \times 10^{-31} kg$ $0.00054858 u$
Electron's charge	e	$-1.60218 \times 10^{-19} C$
Proton's mass		$1.67623 \times 10^{-27} kg$ $1.0073 u$
Proton's charge		$1.60218 \times 10^{-19} C$
Neutron's mass		$1.672493 \times 10^{-27} kg$ $1.0087 u$
Hydrogen-1 mass		$1.0078 u$

Volume Conversion Factors		
1.000 L	=	$1.00 \times 10^3 cm^3$
1.000 gal	=	$3.785 \times 10^3 cm^3$
1.000 ft ³	=	$2.83 \times 10^{-2} m^3$
1.000 qt	=	$9.46 \times 10^2 cm^3$

Energy Conversion Factors		
1.000 cal	=	4.184 J
1.000 eV	=	$1.6202 \times 10^{-19} J$
1.000 eV	=	$96.485 \frac{kJ}{mol}$
1.000 C · V	=	1.000 J
1.0 kW · h	=	$3.600 \times 10^3 kJ$
1.0 L · atm	=	101.325 J

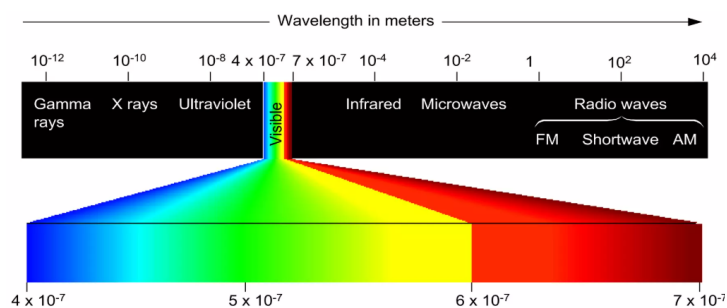
Pressure Conversion Factors		
1.000 atm	=	$1.0133 \times 10^5 Pa$
1.000 atm	=	760 torr
1.000 atm	=	760 mm Hg
1.000 atm	=	14.70 psi
1.000 bar	=	$1.000 \times 10^5 Pa$

Mass Conversion Factors		
2.205 lb	=	1.000 kg
1.000 lb	=	453.6 g
1.000 oz	=	28.35 g
1.000 ton	=	907.2 kg
1.000 u	=	$1.66 \times 10^{-27} kg$

Length Conversion Factors		
1.094 yd	=	1.000 m
0.3937 in	=	1.000 cm
0.6214 mi	=	1.000 km
1.000 Å	=	$1.000 \times 10^{-10} m$

Temperature Conversion Factors	
Celsius (°C)	$T_K = T_C + 273.15$
Fahrenheit (°F)	$T_K = \frac{5}{9}(T_F - 32) + 273$

$M_A = \frac{m_A}{n_A}$	$\chi_A = \frac{n_A}{n_{tot}}$	$M = \frac{n}{v}$	$mass\% A = \frac{m_A}{m_{tot}} 100\%$
$M_1 V_1 = M_2 V_2$	$PV = nRT$	$P_A = \chi_A P_{tot}$	$u_{ave} = \bar{u} = \sqrt{\frac{8RT}{\pi M}}$
$u_{mp} = \sqrt{\frac{2RT}{M}}$	$u_{rms} = \sqrt{\frac{3RT}{M}}$	$\hbar = \frac{h}{2\pi}$	$(KE)_{ave} = \frac{3}{2} RT$
$E = h\nu$	$\lambda\nu = c$	$\lambda = \frac{h}{mv}$	$\Delta p \Delta x \geq \frac{1}{2} \hbar$
$E = -2.178 \times 10^{-18} J \left(\frac{Z^2}{n^2} \right)$		$E = \frac{n^2 h^2}{8mL^2}$	
$\Delta H = \sum D(broken) - \sum D(formed)$		$bond\ order = \frac{bonding - antibonding}{2}$	



Average Bond Energy ($\frac{kJ}{mol}$)			
H-H	432	O-H	467
H-Br	363	O-O	146
H-F	565	F-F	154
H-Cl	427	Cl-Cl	239
C-H	413	Br-Br	193
C-C	347	O=O	495
C-N	305	C=C	614
C-O	358	C=O*	745
C-F	485	C $\equiv$ O	1,072
N-H	391	C $\equiv$ C	839
N-O	201	C $\equiv$ N	891
N-N	160	N $\equiv$ N	941
*C=O (CO ₂) = 799			