CHEM1011

DATA SHEET

Fundamental constants and conversion factors

0 °C = 273 K

1 atm = 760 mmHg = 760 Torr = 101.3 kPa = 1.013 bar

Ideal gas constant $R = 8.314\ \text{J mol}^{-1}\ \text{K}^{-1} = 0.08206\ \text{L atm mol}^{-1}\ \text{K}^{-1}$

Avogadro constant $N_A = 6.022 \times 10^{23}\ \text{mol}^{-1}$

Planck constant $h = 6.626 \times 10^{-34}\ \text{J s}$

Speed of light $c = 2.998 \times 10^{8}\ \text{m s}^{-1}$

Faraday constant $F = 96{,}485\ \text{C mol}^{-1}$

Useful equations

Nernst equation $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \frac{RT}{nF} \ln Q$

Faraday equation $Q = I \times t$ = amount of electrons (mole) $\times F$

Planck equation $E = h\nu = hc/\lambda$

Ideal gas law $PV = nRT$

Rydberg equation $\frac{1}{\lambda} = R_{\text{H}} \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$ where $R_{\text{H}} = 1.097 \times 10^{7}\ \text{m}^{-1}$

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Periodic Group Numbers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

The Periodic Table

1 **H** 1.008																	2 **He** 4.003
3 **Li** 6.941	4 **Be** 9.012											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** 47.88	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** 65.39	31 **Ga** 69.72	32 **Ge** 72.59	33 **As** 74.92	34 **Se** 78.96	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** 95.94	43 ^{99}**Tc** (98.91)	44 **Ru** 101.1	45 **Rh** 102.9	46 **Pd** 106.4	47 **Ag** 107.9	48 **Cd** 112.4	49 **In** 114.8	50 **Sn** 118.7	51 **Sb** 121.8	52 **Te** 127.6	53 **I** 126.9	54 **Xe** 131.3
55 **Cs** 132.9	56 **Ba** 137.3	57 **La** 138.9	72 **Hf** 178.5	73 **Ta** 180.9	74 **W** 183.9	75 **Re** 186.2	76 **Os** 190.2	77 **Ir** 192.2	78 **Pt** 195.1	79 **Au** 197.0	80 **Hg** 200.6	81 **Tl** 204.4	82 **Pb** 207.2	83 **Bi** 209.0	84 ^{210}**Po** (210.0)	85 ^{210}**At** (210.0)	86 ^{222}**Rn** (222.0)
87 ^{223}**Fr** (223.0)	88 ^{226}**Ra** (226.0)	89 ^{227}**Ac** (227.0)															

58 **Ce** 140.1	59 **Pr** 140.9	60 **Nd** 144.2	61 ^{145}**Pm** (144.9)	62 **Sm** 150.4	63 **Eu** 152.0	64 **Gd** 157.3	65 **Tb** 158.9	66 **Dy** 162.5	67 **Ho** 164.9	68 **Er** 167.3	69 **Tm** 168.9	70 **Yb** 173.0	71 **Lu** 175.0
90 **Th** 232.0	91 ^{231}**Pa** (231.0)	92 **U** 238.0	93 ^{237}**Np** (237.0)	94 ^{239}**Pu** (239.1)	95 ^{243}**Am** (243.1)	96 ^{247}**Cm** (247.1)	97 ^{247}**Bk** (247.1)	98 ^{252}**Cf** (252.1)	99 ^{252}**Es** (252.1)	100 ^{257}**Fm** (257.1)	101 ^{256}**Md** (256.1)	102 ^{259}**No** (259.1)	103 ^{260}**Lr** (260.1)

KEY

Atomic N° → 6
Symbol → **C**
Atomic Weight → 12.01

( ) is the relative atomic mass of the most common radioactive isotope, the mass number of which is given as a superscript.

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