

# Integrated Chemistry-Physics Reference Sheet

## Mechanics

$$g = a_g = 9.8 \text{ m/s}^2$$

$$\bar{v} = \frac{\Delta d}{\Delta t}$$

$$\bar{v} = \frac{v_f + v_i}{2}$$

$$\bar{a} = \frac{\Delta v}{\Delta t}$$

$$d = v_i t + \frac{1}{2} a t^2$$

$$v_f^2 = v_i^2 + 2a\Delta d$$

$$a_c = \frac{v^2}{r}$$

$$F = ma$$

$$F = \frac{Gm_1m_2}{r^2}$$

$$G = 6.67 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$$

$$p = mv$$

## Electricity and Magnetism

$$F = \frac{kq_1q_2}{r^2}$$

$$k = 9.0 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2$$

$$E = F/q$$

$$I = \frac{\Delta q}{\Delta t}$$

$$R = \frac{V}{I}$$

$$P = VI = I^2R = \frac{V^2}{R}$$

$$E = kq/r^2$$

## Wave Phenomena

$$T = \frac{1}{f}$$

$$v = f\lambda$$

$$n = \frac{c}{v}$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

## Internal Energy

$$Q = mc\Delta T$$

## Geometric Optics

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$$

$$\frac{h_o}{h_i} = \frac{d_o}{d_i}$$

## Modern Physics

$$E_{\text{photon}} = hf$$

$$KE_{\text{max}} = hf - W_o$$

$$c = \text{speed of light} = 3.0 \times 10^8 \text{ m/s}$$

$$1 \text{ eV} = 1.6 \times 10^{-19} \text{ Joules}$$

$$q_{\text{electron}} = -e = -1.6 \times 10^{-19} \text{ C}$$

$$q_{\text{proton}} = +e = +1.6 \times 10^{-19} \text{ C}$$

$$m_{\text{electron}} = 9.11 \times 10^{-31} \text{ kg}$$

$$m_{\text{proton}} = 1.67 \times 10^{-27} \text{ kg}$$

$$m_{\text{neutron}} = 1.67 \times 10^{-27} \text{ kg}$$

## Energy

$$P = \frac{W}{t} = \frac{Fd}{t}$$

$$PE = mgh$$

$$KE = \frac{1}{2}mv^2$$

## Nuclear Energy

$$E = mc^2$$

## General

$$A = \pi r^2 = \text{area of a circle}$$

$$SA = 4\pi r^2 = \text{surface area of a sphere}$$

$$C = 2\pi r = \text{circumference of a circle}$$

$$D = \frac{m}{v} = \text{density}$$

# Periodic Table Of The Elements

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1 <b>H</b> 1.008	2 <b>He</b> 4.003											13 <b>B</b> 10.81	14 <b>C</b> 12.01	15 <b>N</b> 14.01	16 <b>O</b> 16.00	17 <b>F</b> 19.00	18 <b>Ne</b> 20.18
3 <b>Li</b> 6.941	4 <b>Be</b> 9.012											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31	3 <b>B</b>	4 <b>B</b>	5 <b>B</b>	6 <b>B</b>	7 <b>B</b>	8 <b>B</b>	9 <b>B</b>	10 <b>B</b>	11 <b>B</b>	12 <b>B</b>	13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.07	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.88	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.69	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.39	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.61	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (98)	44 <b>Ru</b> 101.1	45 <b>Rh</b> 102.9	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.9	48 <b>Cd</b> 112.4	49 <b>In</b> 114.8	50 <b>Sn</b> 118.7	51 <b>Sb</b> 121.8	52 <b>Te</b> 127.6	53 <b>I</b> 126.9	54 <b>Xe</b> 131.3
55 <b>Cs</b> 132.9	56 <b>Ba</b> 137.3	57 <b>La</b> 138.9	72 <b>Hf</b> 178.5	73 <b>Ta</b> 180.9	74 <b>W</b> 183.8	75 <b>Re</b> 186.2	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.2	78 <b>Pt</b> 195.1	79 <b>Au</b> 197.0	80 <b>Hg</b> 200.6	81 <b>Tl</b> 204.4	82 <b>Pb</b> 207.2	83 <b>Bi</b> 209.0	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
87 <b>Fr</b> (223)	88 <b>Ra</b> (226)	89 <b>Ac</b> (227)	104 <b>Rf</b> (261)	105 <b>Db</b> (262)	106 <b>Sg</b> (263)	107 <b>Bh</b> (262)	108 <b>Hs</b> (265)	109 <b>Mt</b> (266)	110 <b>(269)</b>	111 <b>(272)</b>	112 <b>(277)</b>	114 <b>(???)</b>					

58 <b>Ce</b> 140.1	59 <b>Pr</b> 140.9	60 <b>Nd</b> 144.2	61 <b>Pm</b> (145)	62 <b>Sm</b> 150.4	63 <b>Eu</b> 152.0	64 <b>Gd</b> 157.3	65 <b>Tb</b> 158.9	66 <b>Dy</b> 162.5	67 <b>Ho</b> 164.9	68 <b>Er</b> 167.3	69 <b>Tm</b> 168.9	70 <b>Yb</b> 173.0	71 <b>Lu</b> 175.0
90 <b>Th</b> 232.0	91 <b>Pa</b> 231.0	92 <b>U</b> 238.0	93 <b>Np</b> (237)	94 <b>Pu</b> (244)	95 <b>Am</b> (243)	96 <b>Cm</b> (247)	97 <b>Bk</b> (247)	98 <b>Cf</b> (251)	99 <b>Es</b> (252)	100 <b>Fm</b> (257)	101 <b>Md</b> (258)	102 <b>No</b> (259)	103 <b>Lr</b> (262)