

1 H 1.008																	18 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	3	4	5	6	7	8	9	10	11	12	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 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 72.64	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 Tc (98)	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 138.91	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 207.20	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (267)	105 Db (268)	106 Sg (269)	107 Bh (270)	108 Hs (270)	109 Mt (278)	110 Ds (281)	111 Rg (282)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (290)	116 Lv (293)	117 Ts (294)	118 Og (294)

58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	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 173.04	71 Lu 174.97
90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (266)

constants

$$R = 0.08206 \text{ L atm/mol K}$$

$$R = 8.314 \text{ J/mol K}$$

$$N_A = 6.022 \times 10^{23} / \text{mol}$$

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

$$c = 3.00 \times 10^8 \text{ m/s}$$

$$F = 96485 \text{ C/mol } e^-$$

$$e = 1.602 \times 10^{-19} \text{ C}$$

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

Rydberg Constants

$$\mathcal{R} = 2.18 \times 10^{-18} \text{ J}$$

$$\mathcal{R} = 3.29 \times 10^{15} \text{ s}^{-1}$$

$$\mathcal{R} = 1.097 \times 10^7 \text{ m}^{-1}$$

conversions

$$1 \text{ atm} = 760 \text{ torr}$$

$$1 \text{ atm} = 101325 \text{ Pa}$$

$$1 \text{ atm} = 1.01325 \text{ bar}$$

$$1 \text{ atm} = 14.7 \text{ psi}$$

$$1 \text{ bar} = 10^5 \text{ Pa}$$

$$1 \text{ in} = 2.54 \text{ cm}$$

$$1 \text{ mi} = 5280 \text{ ft}$$

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

$$1 \text{ lb} = 453.6 \text{ g}$$

$$1 \text{ ton} = 2000 \text{ lbs}$$

$$1 \text{ tonne} = 1000 \text{ kg}$$

$$1 \text{ gal} = 3.785 \text{ L}$$

$$1 \text{ gal} = 231 \text{ in}^3$$

$$1 \text{ fl oz} = 29.57 \text{ mL}$$

conversions

$$1 \text{ cal} = 4.184 \text{ J}$$

$$1 \text{ eV} = 1.602 \times 10^{-19} \text{ J}$$

$$1 \text{ kWh} = 3600 \text{ J}$$

water data

$$C_{s,\text{ice}} = 2.09 \text{ J/g } ^\circ\text{C}$$

$$C_{s,\text{water}} = 4.184 \text{ J/g } ^\circ\text{C}$$

$$C_{s,\text{steam}} = 2.03 \text{ J/g } ^\circ\text{C}$$

$$\rho_{\text{water}} = 1.00 \text{ g/mL}$$

$$\rho_{\text{ice}} = 0.9167 \text{ g/mL}$$

$$\rho_{\text{seawater}} = 1.024 \text{ g/mL}$$

$$\Delta H_{\text{fus}} = 334 \text{ J/g}$$

$$\Delta H_{\text{vap}} = 2260 \text{ J/g}$$

$$K_w = 1.0 \times 10^{-14}$$