

Exam 2 - S20 - McCord - ch305

1											18						
1 H 1.008	2															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	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

$R = 0.08206 \text{ L atm/mol K}$
 $R = 8.314 \text{ J/mol K}$
 $F = 96485 \text{ C/mol e}^-$
 $N_A = 6.022 \times 10^{23} / \text{mol}$
 $h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$
 $c = 3.00 \times 10^8 \text{ m/s}$
 $g = 9.81 \text{ m/s}^2$

conversions

$1 \text{ atm} = 760 \text{ torr}$
 $1 \text{ atm} = 101325 \text{ Pa}$
 $1 \text{ atm} = 1.01325 \text{ bar}$
 $1 \text{ bar} = 10^5 \text{ Pa}$
 $^{\circ}\text{F} = ^{\circ}\text{C}(1.8) + 32$
 $\text{K} = ^{\circ}\text{C} + 273.15$

conversions

$1 \text{ in} = 2.54 \text{ cm}$
 $1 \text{ ft} = 12 \text{ in}$
 $1 \text{ yd} = 3 \text{ ft}$
 $1 \text{ mi} = 5280 \text{ ft}$
 $1 \text{ lb} = 453.6 \text{ g}$
 $1 \text{ ton} = 2000 \text{ lbs}$
 $1 \text{ tonne} = 1000 \text{ kg}$
 $1 \text{ gal} = 3.785 \text{ L}$
 $1 \text{ gal} = 231 \text{ in}^3$
 $1 \text{ gal} = 128 \text{ fl oz}$
 $1 \text{ fl oz} = 29.57 \text{ mL}$

standard potentials at 25 °C E° (V)

$\text{F}_2(\text{g}) + 2 \text{ e}^- \rightleftharpoons 2 \text{ F}^-(\text{aq}) \quad +2.87 \text{ V}$
 $\text{Ce}^{4+}(\text{aq}) + \text{ e}^- \rightleftharpoons \text{Ce}^{3+}(\text{aq}) \quad +1.61 \text{ V}$
 $\text{Cl}_2(\text{g}) + 2 \text{ e}^- \rightleftharpoons 2 \text{ Cl}^-(\text{aq}) \quad +1.36 \text{ V}$
 $\text{Ag}^+(\text{aq}) + \text{ e}^- \rightleftharpoons \text{Ag}(\text{s}) \quad +0.80 \text{ V}$
 $\text{Fe}^{3+}(\text{aq}) + \text{ e}^- \rightleftharpoons \text{Fe}^{2+}(\text{aq}) \quad +0.77 \text{ V}$
 $\text{Cu}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Cu}(\text{s}) \quad +0.34 \text{ V}$
 $2 \text{ H}^+(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{H}_2(\text{g}) \quad \mathbf{0.00 \text{ V}}$
 $\text{Fe}^{3+}(\text{aq}) + 3 \text{ e}^- \rightleftharpoons \text{Fe}(\text{s}) \quad -0.04 \text{ V}$
 $\text{Pb}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Pb}(\text{s}) \quad -0.13 \text{ V}$
 $\text{Ni}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Ni}(\text{s}) \quad -0.23 \text{ V}$
 $\text{Cd}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Cd}(\text{s}) \quad -0.40 \text{ V}$
 $\text{Cr}^{3+}(\text{aq}) + \text{ e}^- \rightleftharpoons \text{Cr}^{2+}(\text{aq}) \quad -0.41 \text{ V}$
 $\text{Zn}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Zn}(\text{s}) \quad -0.76 \text{ V}$
 $\text{Mn}^{2+}(\text{aq}) + 2 \text{ e}^- \rightleftharpoons \text{Mn}(\text{s}) \quad -1.18 \text{ V}$
 $\text{Al}^{3+}(\text{aq}) + 3 \text{ e}^- \rightleftharpoons \text{Al}(\text{s}) \quad -1.66 \text{ V}$
 $\text{Li}^+(\text{aq}) + \text{ e}^- \rightleftharpoons \text{Li}(\text{s}) \quad -3.05 \text{ V}$