Exam 4

NOTE: your scores for this exam will not be released until later this afternoon (once all students have finished the exam)

And for what it's worth: 1 F = 96485 C/mol e⁻ and R = 8.314 J/mol K

Periodic Table of the Elements

1A 1												3A 13	4A 14	5A 15	6A 16	7A 17	8A 18
1 H 1.008	2A 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	3B 3	4B 4	5B 5	6B 6	7B 7	8B 8	8B 9	8B 10	1B 11	2B 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 (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (281)	111 Rg (281)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (289)	116 Lv (293)	117 Ts (293)	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 (262)

Half Reaction	Potential
$F_2 + 2e^- \rightleftharpoons 2F^-$	+2.87 V
$Au^+ + e^- \rightleftharpoons Au$	+1.69 V
$Au^{3+} + 3e^- \rightleftharpoons Au$	+1.498 V
$Ag^+ + e^- \rightleftharpoons Ag$	+0.800 V
$Fe^{3+} + e^- \rightleftharpoons Fe^{2+}$	+0.77 V
$Cu^{2+} + 2e^- \rightleftharpoons Cu$	+0.34 V
$Bi^{3+} + 3e^- \rightleftharpoons Bi$	+0.317 V
$2H^+ + 2e^- \rightleftharpoons H_2$	**0.000 V**
$Fe^{3+} + 3e^- \rightleftharpoons Fe$	−0.040 V
$Ni^{2+} + 2e^- \rightleftharpoons Ni$	−0.23 V
$V^{3+} + e^- \rightleftharpoons V^{2+}$	−0.255 V
$Co^{2+} + 2e^- \rightleftharpoons Co$	−0.28 V
$Fe^{2+} + 2e^- \rightleftharpoons Fe$	−0.44 V
$U^{4+} + e^- \rightleftharpoons U^{3+}$	−0.52 V
$Zn^{2+} + 2e^- \rightleftharpoons Zn$	−0.76 V
$V^{2+} + 2e^- \rightleftharpoons V$	−1.13 V
$Al^{3+} + 3e^- \rightleftharpoons Al$	−1.66 V
$K^+ + e^- \rightleftharpoons K$	−2.92 V
$Li^+ + e^- \rightleftharpoons Li$	−3.05 V

Note: all ions are aqueous (aq), and all the neutral species are solid metals (except H_2 which is a gas).