(5) LEO GER

$Fe_2S_3 + KHNO_3 \rightarrow 2Fe(NO_3)_3 + 3S^0 + 6NO_2 + 6H_2O$

NO_3^{-1}

$+5 - 6 = -1$

$Cr_2O_7^{-2}$

$+12 - 14 = -2$

Apr 3-7:35 AM

(8) $BrO^- + Fe(OH)_2 \rightarrow Br^- + Fe(OH)_3$ BASIC SOLN

$2e^- + 2H^+ + BrO^- \rightarrow Br^- + H_2O$

$1 \times H_2O + 2Fe(OH)_2 \rightarrow 2Fe(OH)_3 + 2H^+ + 2e^-$

$BrO^- + H_2O + 2Fe(OH)_2 \rightarrow Br^- + 2Fe(OH)_3$ ✓

Apr 3-8:05 AM

(10) $ClO^- + S_2O_3^{-2} \rightarrow Cl^- + SO_4^{-2}$ BASIC SOL'N

$8e^- + 8H^+ + 4ClO^- \rightarrow 4Cl^- + 4H_2O$

$5H_2O + S_2O_3^{-2} \rightarrow 2SO_4^{-2} + 10H^+ + 8e^-$

$2OH^- + 4ClO^- + H_2O + S_2O_3^{-2} \rightarrow 4Cl^- + 2SO_4^{-2} + 2H^+$

$2H^+ + 2OH^- \rightarrow 2HOH$

$2OH^- + 4ClO^- + S_2O_3^{-2} \rightarrow 4Cl^- + 2SO_4^{-2} + H_2O$ ✓

-2 -4 -2 -4 -4

Apr 3-8:12 AM

(14) $H_2 + O_2 \rightarrow H_2O$

0 0 +1 -2

GER

OX

(15) Spont

(f) $\Delta G < 0$

$\Delta E > 0$

$K > 1$

Apr 3-8:23 AM

(16) $Pb^{+2} + Zn^{\circ}_{(s)} \rightarrow Zn^{+2} + Pb^{\circ}_{(s)}$

1M 0.0002M

$E = E^{\circ} - \frac{RT}{nF} \ln \frac{[Zn^{+2}]}{[Pb^{+2}]}$

$E = 0.637 - \frac{(8.314)(298)}{2(96500)} \ln \frac{0.0002}{1}$

$E = 0.746_v$

(E) p1117

$Pb^{+2} + 2e^- \rightarrow Pb^{\circ}$ -0.126_v

$Zn \rightarrow Zn^{+2} + 2e^-$ $+0.763_v$

$+0.637_v$

Apr 3-8:26 AM

(18) $Cu/Cu^{+2} \,//\, Ag^{+}/Ag$

1M $1 \times 10^{-3}M$

$Cu + Ag^{+} \rightarrow Cu^{+2} + Ag$

$E = E^{\circ} - \frac{RT}{nF} \ln \frac{Cu^{+2}}{Ag^{+}}$

$E = 0.462 - \frac{(8.314)(298)}{(2)(96500)} \ln \frac{1}{1 \times 10^{-3}}$

$E = 0.373_v$

Apr 3-8:36 AM

(23) $E^\circ = \frac{RT}{nF} \ln K$

1

Apr 3-8:42 AM

E - Never mult by coeff

R = 8.314

Volts, Joules

Q KJ R = $8.314 * 10^{-3}$ KJ

Apr 3-8:45 AM

Electrochemical (Voltaic) $E = E^\circ - \frac{RT}{nF} \ln Q$

$E^\circ = \frac{RT}{nF} \ln K$.

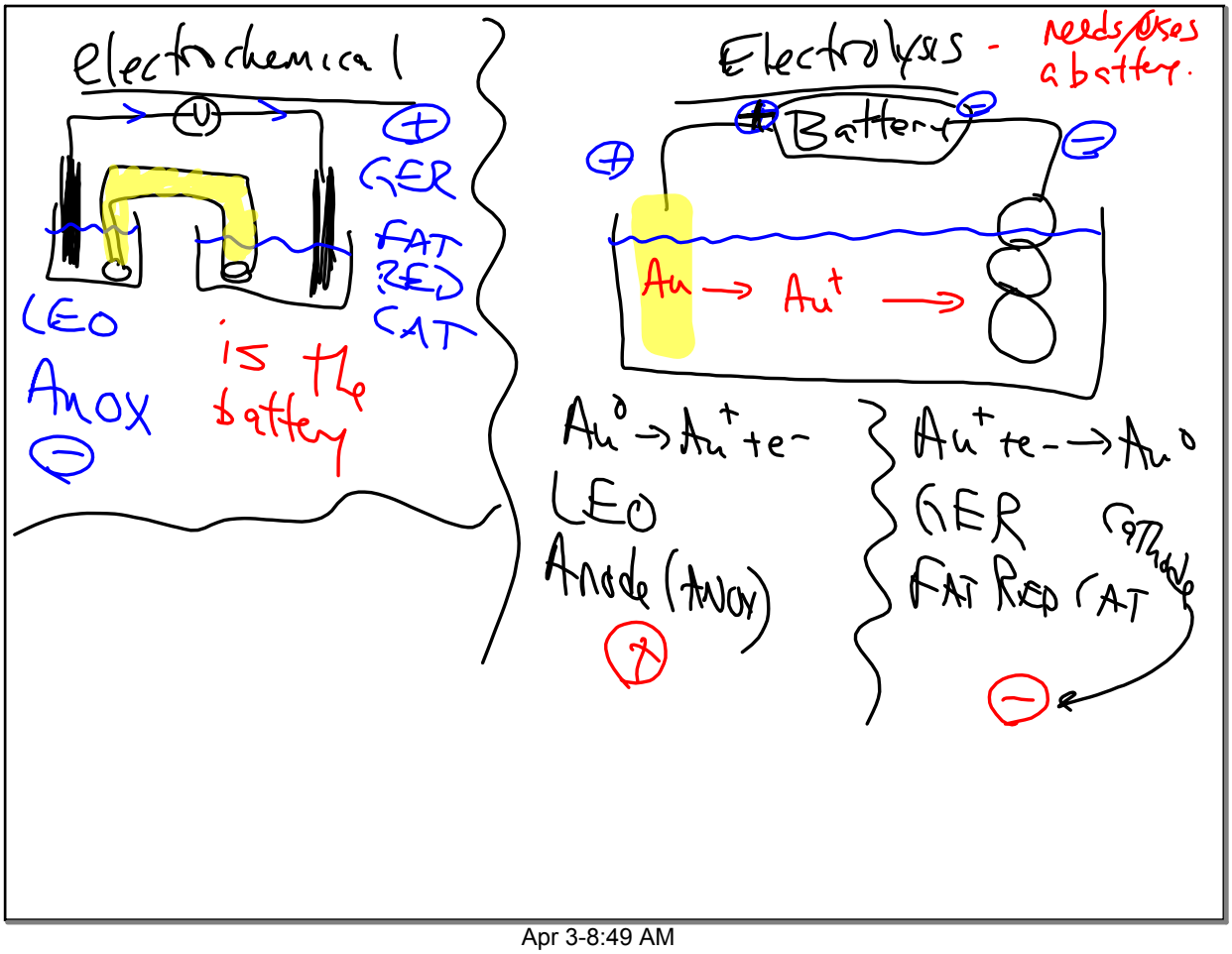
IS the battery

→ Spont. chem rxns producing a current (voltage)

Electrolysis → Non-Spont.

Needs a battery to force the rxn to proceed.

Apr 3-8:47 AM



Apr 3-8:49 AM

Electrolysis Calculations

Coulomb = amp * sec

Ampere

$Amp = \frac{Coul}{sec}$

$1F = \frac{96500\ cal}{Mole\ e^-}$

n = # mole e^- once e^- gained = e⁻ (out)

Periodic table → Moles ⇌ Mass in gram

Apr 3-9:00 AM

Calc # g Al produced in 1 hour → 3600 sec by electrolysis of molten $Al^{+3}Cl_3$ if electrical current is 1 amp. = $\frac{1\ coul}{sec}$

$\frac{1\ Mole\ Al}{3\ Mole\ e^-}$ $\frac{1\ Mole\ Al}{27\ g}$ PT $\frac{96500\ cal}{1\ Mole\ e^-}$ n = 3

$$\frac{27\ g\ Al}{1\ Mole\ Al} \left| \frac{1\ Mole\ Al}{3\ Mole\ e^-} \right| \frac{1\ Mole\ e^-}{96500\ cal} \left| \frac{1\ cal}{1\ sec} \right| \frac{3600\ sec}{1\ hr} = 0.3369\ g\ Al$$

n = 3

Apr 3-9:04 AM

Mg^0 $Mg^{+2}Cl_2$ Find ___ g Mg formed.

60 amps = 60 cal / sec

4000 sec.

F

1 mole Mg / 2 mole e⁻

1 mole Mg / 24 g Mg

96500 cal / mole e⁻

$$\frac{24\text{ g Mg}}{1\text{ Mole Mg}} \left| \frac{1\text{ Mole Mg}}{2\text{ Mole e}^-} \right| \frac{1\text{ Mole e}^-}{96500\text{ cal}} \left| \frac{60\text{ cal}}{1\text{ sec}} \right| \frac{4000\text{ sec}}{}$$

Apr 3-9:11 AM

PS20-1 # 24-28

Apr 3-9:15 AM