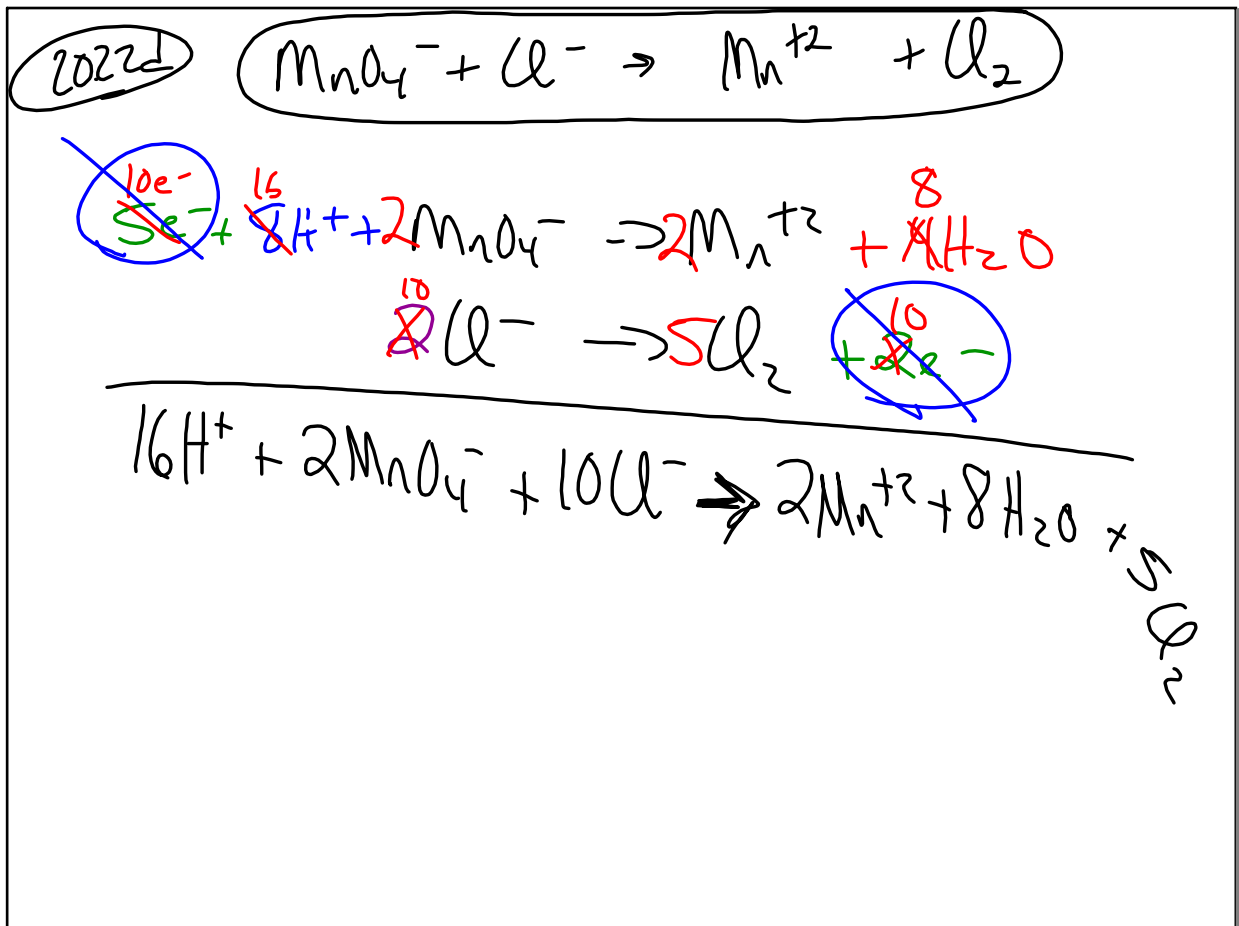


Mar 28-7:31 AM



Mar 28-8:01 AM

Voltaic cells → electrochemical cells

~~$2e^- + Zn^{+2} \rightarrow Zn^0 - 0.763\text{v}$~~

$2e^- + Cu^{+2} \rightarrow Cu^0$ $E^{\circ}_{red} + 0.337\text{v}$ RED

$Zn^0 \rightarrow Zn^{+2} + 2e^-$ $E^{\circ}_{ox} = +0.763\text{v}$

$Zn^0 + Cu^{+2} \rightarrow Cu^0 + Zn^{+2}$ $E^{\circ}_{cell} = +1.10\text{v}$

Voltage electrode potential. STP, 1M

Mar 28-8:07 AM

$Zn^0_{(s)} + Cu^{+2}_{(aq)} \rightarrow Cu^0_{(s)} + Zn^{+2}_{(aq)}$

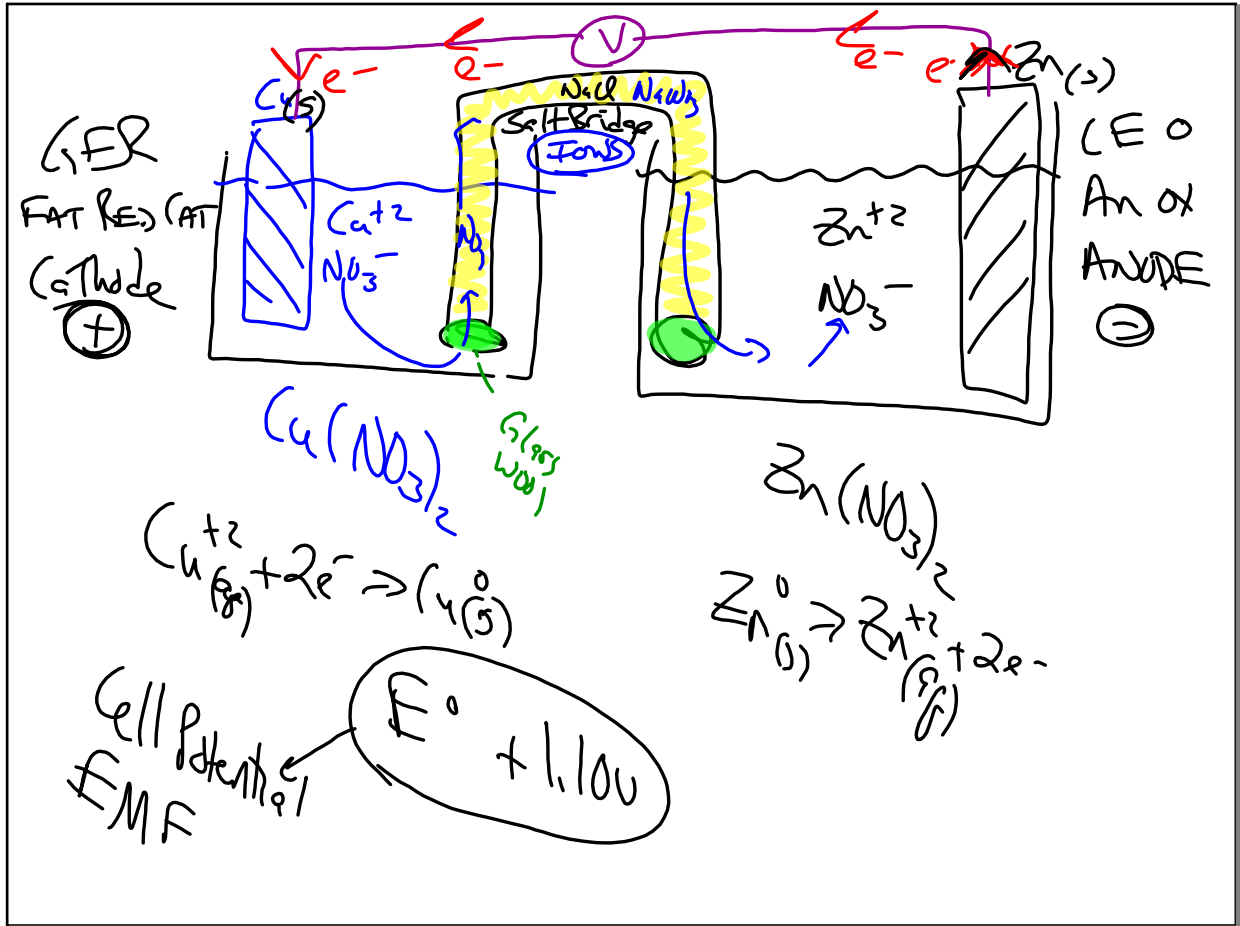
AnOx = Anode
LEO

$Zn^0_{(s)} \rightarrow Zn^{+2}_{(aq)} + 2e^-$ $E^{\circ}_{ox} + 0.763\text{v}$

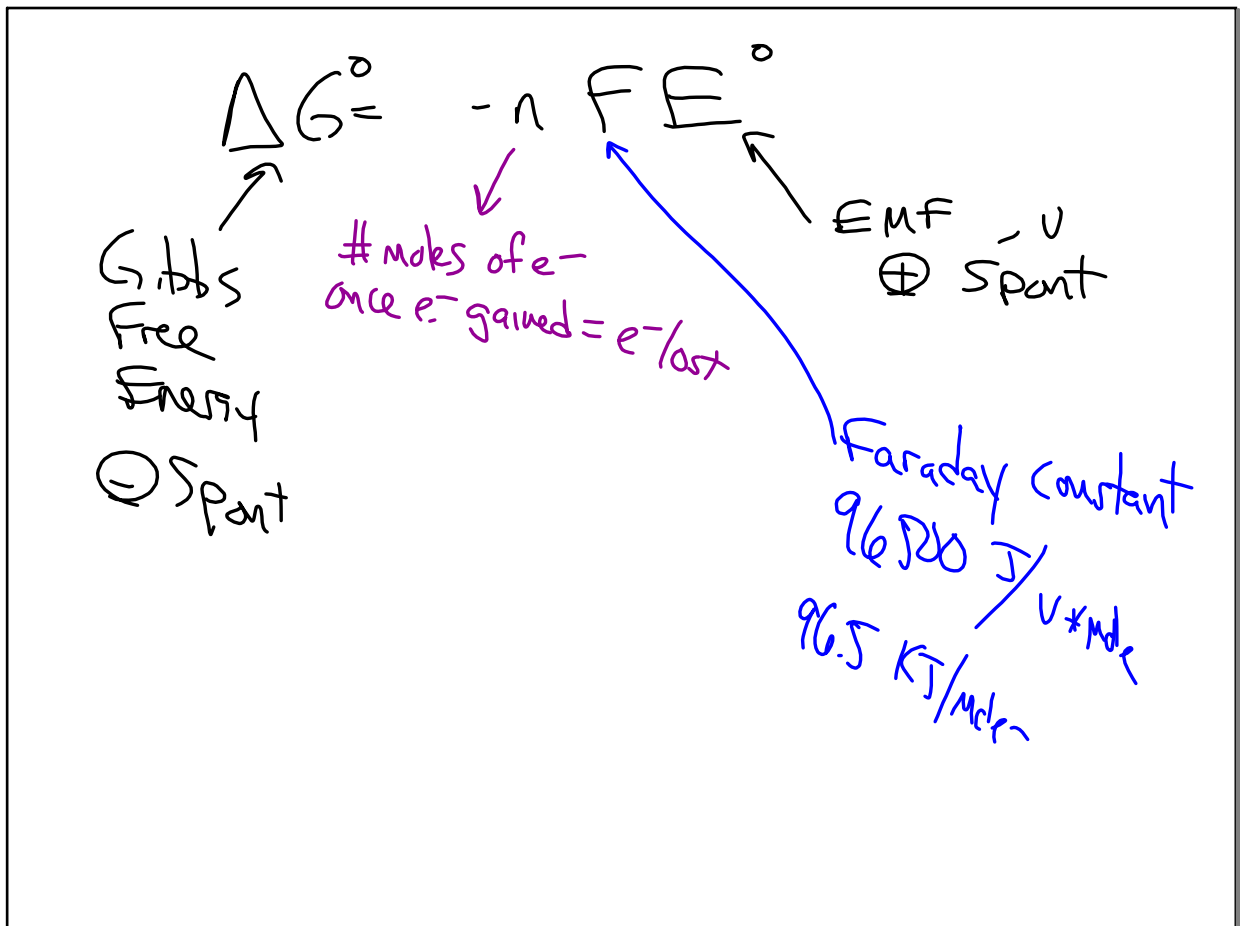
$Cu^{+2}_{(aq)} + 2e^- \rightarrow Cu^0_{(s)}$ $E^{\circ}_{red} + 0.337\text{v}$

GFR Red cat Cathode

Mar 28-8:24 AM



Mar 28-8:38 AM



Mar 28-8:47 AM

Cu / Zn

$$\Delta G^\circ = -nFE^\circ$$

$$\Delta G = - (2) (96500) (1.10)$$

$$\Delta G = -212.3 \text{ KJ}$$

Mar 28-8:51 AM

$$\Delta G = \Delta G^\circ + RT \ln Q$$

$$\frac{-nFE}{-nF} = \frac{-nFE^\circ}{-nF} + \frac{RT \ln Q}{-nF}$$

$$\Delta G = -nFE$$

$$E = E^\circ - \frac{RT}{nF} \ln Q$$

Cookie
DARE

Mar 28-8:56 AM

Not IM solns

$$\text{Cu}^{+2} + \text{Zn}^0 \rightarrow \text{Cu}^0 + \text{Zn}^{+2}$$

① $\Delta G = -nFE$

② $\Delta G^\circ \rightarrow \Delta G = \Delta G^\circ + RT \ln Q$

Mar 28-8:54 AM

Nernst EQN

$\text{Cu}^{+2} + \text{Zn}^0 \rightarrow \text{Zn}^{+2} + \text{Cu}^0$

NOT a IM Δ

$$E = E^\circ - \frac{RT}{nF} \ln Q$$

$Q = \frac{[\text{Zn}^{+2}]}{[\text{Cu}^{+2}]}$

$R = 8.314 \text{ J/Mole} \cdot \text{K}$
 $T = \text{KELVIN}$

$n = 2$

Mar 28-8:55 AM

$$\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + 14\text{H}^+(\text{aq}) + 6\text{I}^-(\text{aq}) \rightarrow 2\text{Cr}^{3+}(\text{aq}) + 3\text{I}_2(\text{s}) + 7\text{H}_2\text{O}(\text{l})$$

2M 1M 1M $1 \times 10^{-3}\text{M}$ (s) (l)

$E = E^\circ - \frac{RT}{nF} \ln Q$

$E = +0.794 - \frac{(8.314)(298)}{6(96500)} \ln \frac{5 \times 10^{-11}}{}$

$E = 0.896\text{V}$

Find E_{cell}

$$Q = \frac{[\text{Cr}^{3+}]^2}{[\text{Cr}_2\text{O}_7^{2-}][\text{H}^+]^{14}[\text{I}^-]^6}$$

$$Q = \frac{(1 \times 10^{-3})^2}{(2)(1)^{14}(1)^6} = \frac{1 \times 10^{-6}}{2} = 0.5 \times 10^{-6} = 5 \times 10^{-7}$$

P117 for E°

Cr	+1.33
I	-0.536
E°	0.794V

Mar 28-9:01 AM

20 / 54 + 62

Mar 28-9:15 AM