

(17) $Zn / Zn^{+2} \parallel Cu^{+2} / Cu^0$
 $1 \times 10^{-5} M$
 $E = 1.3V$
 $25^{\circ}C$
 $Zn^0 + Cu^{+2} \rightarrow Zn^{+2} + Cu^0 \quad E^{\circ} = 1.10 \text{ volts}$
 $E = E^{\circ} - \frac{RT}{nF} \ln \frac{[Zn^{+2}]}{[Cu^{+2}]}$

 $1.3 = 1.1 - \frac{(8.314)(298)}{2(96500)} \ln \frac{x}{1 \times 10^{-5}}$
 $-1.1 - 1.1$

 $\frac{-2(96500)0.2}{8.314(298)} = - \frac{(8.314)(298)}{(2)(96500)} \ln \frac{x}{1 \times 10^{-5}} \quad * \frac{-2(96500)}{8.314(298)}$
 $-15.58 = \ln \frac{x}{1 \times 10^{-5}}$
 $1.713 \times 10^{-7} = \frac{x}{1 \times 10^{-5}} \quad x = 1.713 \times 10^{-12}$

Apr 2-7:21 AM

(20) M^{+n} , $\frac{1 \text{ mole } M}{110 \text{ g } M}$, $\frac{0.75 \text{ coul}}{\text{sec}}$, 1800 sec
 Find Charge # $\text{mole } e^-$
 $0.513 \text{ g } M$, $\frac{96500 \text{ coul}}{1 \text{ mole } e^-}$
 0.75 Amp
 30 min

1 mole e^-	0.75 coul	1800 sec	110 g	= $3e^-$
96500 coul	sec		1 mole e^-	

Apr 2-7:53 AM



Apr 2-8:01 AM

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

$2 = \frac{(8.314)(298)}{6(96500)} \ln K$

$K = 9.69 \times 10^{202}$
 $= 10 \times 10^{202}$
 $= 1 \times 10^{203}$

$\left. \begin{array}{l} \text{Al} \rightarrow \text{Al}^{+3} \quad + 1.66 \\ \text{Cu}^{+2} \rightarrow \text{Cu}^0 \quad + 0.34 \\ \hline E^\circ = 2 \end{array} \right\}$

Apr 2-8:09 AM

(24) $K_2Cr_2O_7$, 10 amps , 100 g Cr^0 , $\frac{1 \text{ mole Cr}}{52 \text{ g Cr}}$

$\overset{+1}{K}_2 \overset{+6}{Cr}_2 \overset{-2}{O}_7$, $\overset{10 \text{ coul}}{\text{sec}}$
 $\overset{+12}{Cr}_2 \overset{-14}{O}_7 = 0$

$\frac{96500 \text{ coul}}{1 \text{ mole e}^-}$, $\frac{1 \text{ mole Cr}}{52 \text{ g Cr}}$
 $\boxed{6} \text{ mole e}^-$

1 sec	96500 coul	6 mole e ⁻	1 mole Cr	100 g Cr
10 coul	1 mole e ⁻	1 mole e ⁻	52 g Cr	

$= 111354.72 \text{ sec}$
 1855.911 min
 30.93 hr
 1.2888 days

Apr 2-8:13 AM

(29) $E_1^0 = -1.69$
 $E_2^0 = 1.46$

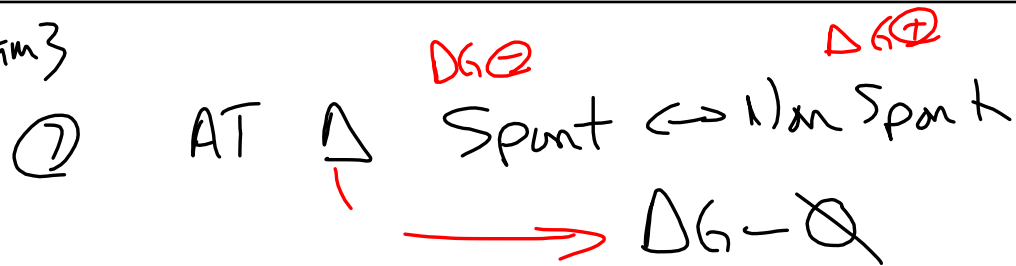
$E^0 = -0.23 \text{ V}$

$E^0 = \frac{RT}{nF} \ln K_{sp}$

$-0.23 = \frac{(8.314)(298)}{2(96500)} \ln K_{sp}$

Apr 2-8:27 AM

Exam 3



$$\Delta G = \Delta H - T \Delta S$$

$$0 = \Delta H - T \Delta S$$

$$\Delta H = T \Delta S$$

$$T = \frac{\Delta H}{\Delta S} = \frac{573}{1.64} = 349.39 \text{ Kelvin}$$

Apr 2-8:35 AM

⑧ $\Delta G = \Delta H - T \Delta S$

$$\Delta G' = (-103.8) - [298(-0.029)]$$

$$\Delta G' = -95.158 \text{ KJ}$$

$$\Delta G = RT \ln K$$

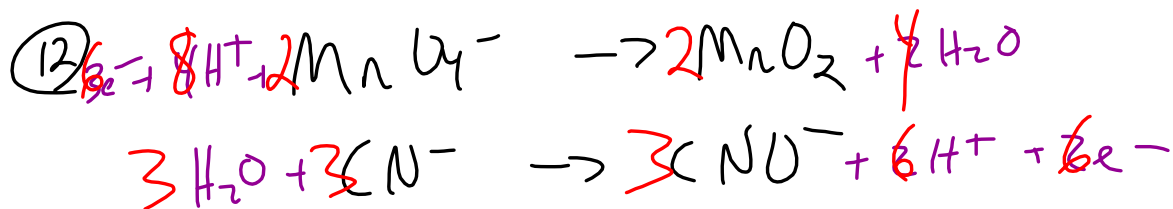
$$-95.158 = -(8.314 \times 10^{-3})(298) \ln K$$

Apr 2-8:38 AM

$$\textcircled{10} \quad E^{\circ} = \frac{RT}{nF} \ln K$$

$$E^{\circ} = \frac{(8.314)(298)}{2(96500)} \ln 3.9 \times 10^{-6}$$

Apr 2-8:42 AM



Apr 2-8:46 AM