

$$\textcircled{11} \quad \Delta G^\circ = \Delta H^\circ - T\Delta S^\circ \quad \left. \vphantom{\Delta G^\circ} \right\} \quad \Delta G^\circ = -RT \ln K$$

$$\Delta G^\circ = (-103.8) - [298(0.029)] \quad \left. \vphantom{\Delta G^\circ} \right\} \quad -95.158 = (-8314 \times 10^{-3})$$

$$\Delta G^\circ = -95.158 \text{ kJ} \quad \left. \vphantom{\Delta G^\circ} \right\} \quad (298)(\ln K)$$

$$\ln K = 38.4077$$

$$K = 4.79 \times 10^{16}$$

Apr 5-7:32 AM

$$\textcircled{15} \quad \text{Zn}^\circ + \text{O}_2 \rightarrow \text{ZnO}^\circ$$

1.5amps $\frac{1.5 \text{ cal}}{\text{Sec}}$ 25hrs

$\frac{1 \text{ mole Zn}}{2 \text{ mole e}^-}$ $\frac{96500 \text{ cal}}{1 \text{ mole e}^-}$ $\frac{1 \text{ mole Zn}}{65.38 \text{ g Zn}}$

$\frac{65.38 \text{ g Zn}}{1 \text{ mole Zn}}$	$\frac{1 \text{ mole Zn}}{2 \text{ mole e}^-}$	$\frac{1 \text{ mole e}^-}{96500 \text{ cal}}$	$\frac{1.5 \text{ cal}}{\text{Sec}}$	$\frac{60 \text{ Sec}}{1 \text{ min}}$	$\frac{60 \text{ min}}{1 \text{ hr}}$	$\frac{25 \text{ hr}}{1 \text{ hr}}$
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Apr 5-8:07 AM

(18) $Zn(s) + 2H^+ \rightarrow Zn^{+2} + H_2(g)$ $E^\circ = +0.763V$
0.001M 1M (atm)

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

$E = 0.763 - \frac{8.314(298)}{2(96500)} \ln 10^6$

$Zn \rightarrow Zn^{+2} + 2e^- + 0.763$
 $2e^- + 2H^+ \rightarrow H_2$

$Q = \frac{[Zn^{+2}][H_2]}{(H^+)^2} = \frac{(1)(1)}{(0.001)^2}$
 $= \frac{1}{(10^{-3})^2} = \frac{1}{10^{-6}}$

Apr 5-8:16 AM

(20) $H_2O + CN^- \rightarrow CNO^- + 2H^+ + 2e^-$

$2e^- + 2Fe^{+3} \rightarrow 2Fe^{+2}$

(23) $Al / Al^{+3} // Ni^{+2} / Ni$

$Al \rightarrow Al^{+3} + 3e^-$ (FO) $+1.66$

$Ni^{+2} + 2e^- \rightarrow Ni$ (RR) -0.230

Apr 5-8:26 AM

(24)

$$\textcircled{9} - 0.854, - 0.403$$

Apr 5-8:35 AM

(ECl)

$$E = E^{\circ} - \frac{RT}{nF} \ln \frac{[Cr^{+3}]}{[Ag^+]^3}$$
$$1.5 = E^{\circ} - \frac{(8.314)(298)}{3(96500)} \ln \frac{0.3}{(0.1)^3}$$

Apr 5-8:40 AM

$\text{Zn} / \text{Zn}^{2+} // \text{H}^+ / \text{H}_2$
 0.1M atm
 $E = 0.6V$
 Find pH
 Cathode

$\text{Zn} \rightarrow \text{Zn}^{2+} + 2e^- \quad E^\circ_{\text{ox}} = +0.763$
 $2\text{H}^+ + 2e^- \rightarrow \text{H}_2 \quad E^\circ_{\text{red}} = 0$

$\text{Zn} + 2\text{H}^+ \rightarrow \text{Zn}^{2+} + \text{H}_2(g) \quad E^\circ_{\text{cell}} = +0.763V$

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

$0.6 = 0.763 - \frac{(8.314)(298)}{2(96500)} \ln \frac{(0.1)(1)}{(\text{H}^+)^2}$

$Q = \frac{(\text{Zn}^{2+})(\text{H}_2)}{(\text{H}^+)^2}$
 $\text{pH} = -\log(\text{H}^+)$

Apr 5-8:43 AM

$\text{p} + \text{n} \rightarrow 12$
 AT MASS
 $\#p \rightarrow 6$
 AT #

\leftarrow ~~different~~
 $\alpha, \beta, \gamma, \delta$
 US

14
 6
 isotope.

elements are neutral $\#p = \#e^-$

Ions \rightarrow gain e^- \ominus ion (Anion)
 \rightarrow lose e^- \oplus ion (Cation)

Isotope \rightarrow Same element, A mass (AT number)

Apr 5-9:01 AM

Alpha Particles $\begin{matrix} 4 \\ 2 \end{matrix} \text{He} - \alpha$
2p 2n He nucleus.

Beta Particle β^- $\begin{matrix} 0 \\ -1 \end{matrix} e$
Nuclear change

Positron β^+ $\begin{matrix} 0 \\ +1 \end{matrix} e$
Nuclear change

Gamma Radiation γ
→ pure energy
X-ray
mass
charge

Apr 5-9:09 AM