

Elektro. Öving 6, Vegard G. Jøvell

Oppg. 1) $\Delta\mu = \mu_l - \mu_c = RT \ln\left(\frac{c_l}{c_c}\right) + F\Delta\phi = 0$

$$\Delta\mu = RT \ln 10^{-4} = -23 \text{ kJ/mol} + F\Delta\phi = 0$$

$$\Delta\phi = \frac{23 \text{ kJ/mol}}{F} = 0,24 \text{ V}$$

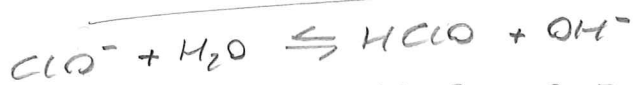
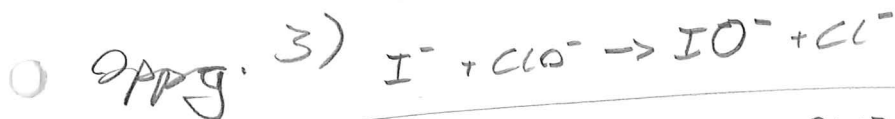
Oppg. 2) $\Delta\mu = 0$

$$\mu_{\text{H}_2\text{O}}^{\text{met}} - \mu_{\text{n-out}}^{\text{met}} = 0$$

$$\mu_{\text{H}_2\text{O}}^{\text{O, met}} + RT \ln\left(\frac{a_{\text{H}_2\text{O}}^{\text{met}}}{a_{\text{n-out}}^{\text{met}}}\right) - \mu_{\text{n-out}}^{\text{O, met}} = 0$$

$$\frac{a_{\text{H}_2\text{O}}^{\text{met}}}{a_{\text{n-out}}^{\text{met}}} = \exp\left(\frac{-\Delta\mu_{\text{H}_2\text{O}}^{\text{O}}}{RT}\right) = 16,2$$

$$\frac{a_{\text{H}_2\text{O}}^{\text{met}}}{a_{\text{n-out}}^{\text{met}}} = 0,06$$



Jøhikindisk likning:



$$r = k^+ a_{\text{ClO}^-} a_{\text{OH}^-}^{-1} a_{\text{I}^-} - k^- a_{\text{Cl}^-} a_{\text{OH}^-}^{-1} a_{\text{IO}^-}^{+1}$$

Oppg. 3b)

Stokkkinetiske ligning:



$r = k^+ a_{NO}^2 - k^- a_{NO_2}^2 a_{O_2}^{-1}$

Oppg. 5)

~~$\frac{Q_{out}}{Q_{in}}$~~ $Q_{out}^{an} = n_e F$ $Q_{in}^{an} = t_+ n_e F - t_- n_e F$

$Q_{out} + Q_{in} = 0$

$\Delta n_{Cl}^{an} = Q_{out} + t_- n_e F$

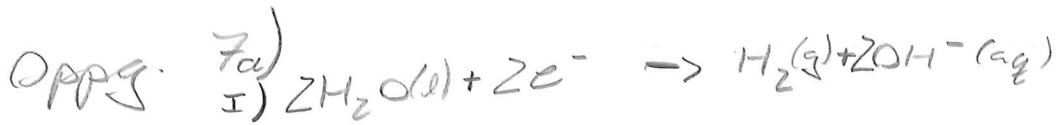
$\Delta n_{Cl}^{an} = (t_- - 1) n_e F$

$\Delta n_{Cl}^{an} = (t_- - (t_+ + t_-)) n_e F = -t_+ n_e F \quad \square$

$\Delta n_{H^+}^{cat} = -n_e F + t_+ n_e F$

$\Delta n_{H^+}^{cat} = (t_+ - 1) n_e F = -t_- n_e F \quad \square$

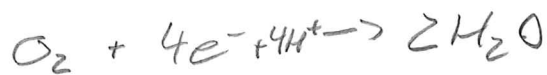
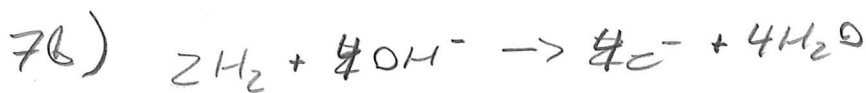
Oppg. 7a)



$\Delta G^0 = G_{OH^-}^0 + G_{H^+}^0 - G_{H_2O}^0 \rightarrow E^0 = \frac{-\Delta G^0}{nF} = \frac{-\Delta G^0}{4F}$

Med disse halvreaksjonene er cellen elektrolytisk mot høyre

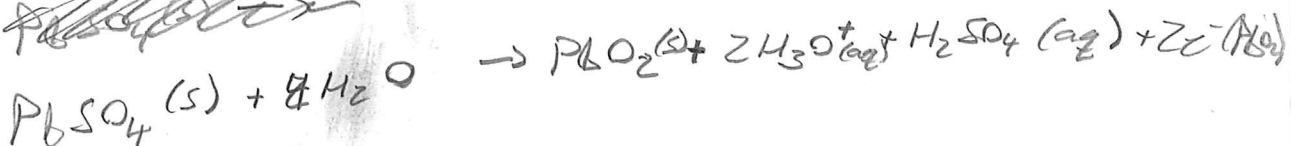
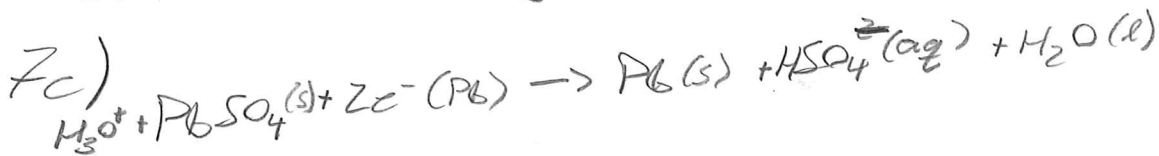
Negativ elektrose er katoden (I)



$$\Delta G^\circ = 2G_{H_2O}^\circ - 2G_{H_2}^\circ - G_{O_2}^\circ$$

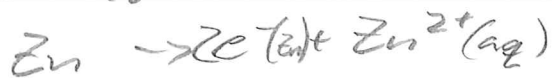
$$E^\circ = \frac{-\Delta G^\circ}{nF} = \frac{-\Delta G^\circ}{4F}$$

- Cellen er galvanisk ved rx mot høyre
- Anoden er negativ elektrode



$$E_{con}^\circ = E_{red}^\circ - E_{oks}^\circ$$

- Ved rx mot høyre er cellen ~~galvanisk~~ Elektrolytisk
- ~~Anoden~~ katoden er negativ



- Cellen er galvanisk ved rx ^{mot høyre}
- $E^\circ \approx 1,7 V = E_{red}^\circ - E_{oks}^\circ$
- Anoden er negativ

Oppg. 8:

Null voltage: 0,85

ii) ved $\Delta E = 0,2V$ er $I = -150mA$
(galvanisk rx)

iii) $\Delta E = 1V \rightarrow I = 50mA$
Elektrolytisk rx.