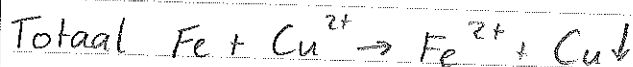
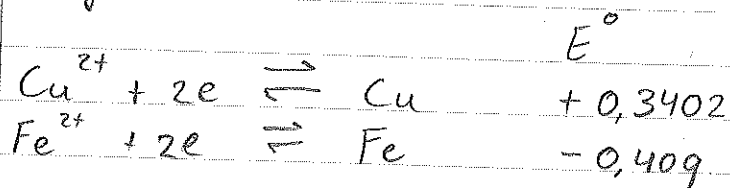


Proef III

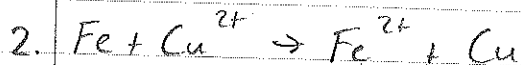
Halfreacties



Galvanische cel:

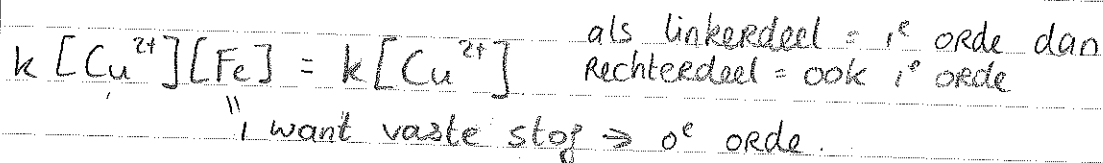


$$\text{EMK} = E_{\text{Cu}} - E_{\text{Fe}} = +0,3402 - (-0,409) = 0,7492 \text{ V}$$



Mijnbouwchemie
deel 1 \rightarrow

$$-\frac{1}{a} \frac{d[\text{Fe}]}{dt} = -\frac{1}{b} \frac{d[\text{Cu}^{2+}]}{dt} = \frac{1}{m} \frac{d[\text{Fe}^{2+}]}{dt} = \frac{1}{n} \frac{d[\text{Cu}]}{dt}$$



\rightarrow eerste orde reactie

3. $-\frac{d[A]}{dt} = k[A]$

$$-k[A] = \frac{d[A]}{dt} \rightarrow -k[A] dt = d[A]$$

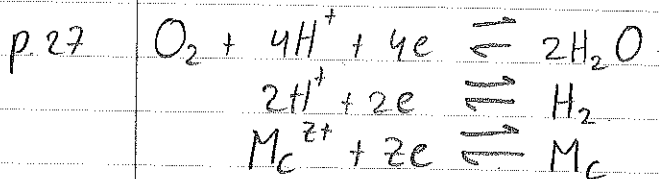
$$\rightarrow -\frac{d[\text{Cu}^{2+}]}{dt} = k [\text{Cu}^{2+}] \quad \leftarrow \text{op } t=0$$

$$\text{integreeren } kt = \ln \frac{[\text{Cu}^{2+}]_0}{[\text{Cu}^{2+}]}$$

grafiek maken; gebruik alleen eerste rechte stuk
voor afvlakken voor bepalen van k.

Proef III vervolg

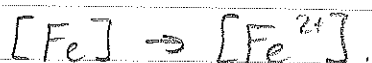
5. ppm = mg/kg = mg/L (in water)



$\Delta[\text{Cu}^{2+}]$ reageert weg.

$$0,1 \text{ M } [\text{Cu}^{2+}] = 6355 \text{ ppm.}$$

je weet hoeveel ppm verdwijnt; gebruikt 0,5 L.

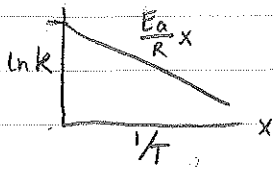


in principe reageert er meer ijzer weg dan dat er koper gevormd wordt omdat Fe nog reageert met O_2 .

8. opp + volume berekenen van bol aan de hand van gegeven diameter
- gew toegevoegde bolletjes · dichtheid v. ijzer
 - aantal bolletjes
 - totaal beschikbaar reactieoppervlakte

10. Arrhenius: $\ln k = \ln A - \frac{E_a}{RT}$

p. 98
Mijnbouwchemie
deel II



12. $T = 45^\circ\text{C} = 318\text{ K}$

$$E_{\text{Pb}}^\circ + \frac{RT}{zF} \ln a_{\text{Pb}^{2+}} = E_{\text{Zn}}^\circ + \frac{RT}{zF} \ln a_{\text{Zn}}$$

$$-0,13 + \frac{8,314 \cdot 318}{2 \cdot 96500} \ln a_{\text{Pb}} = -0,76 + \frac{8,314 \cdot 318}{2 \cdot 96500} \ln a_{\text{Zn}}$$

$$-0,13 + 0,014 \ln a_{\text{Pb}} = -0,76 + 0,014 \ln a_{\text{Zn}}$$

$$0,63 = -0,014 \ln a_{\text{Pb}} + 0,014 \ln a_{\text{Zn}}$$

$$45,99 = \log \left(\frac{a_{\text{Zn}}}{a_{\text{Pb}}} \right)$$

$$\frac{a_{\text{Zn}}}{a_{\text{Pb}}} = 9,77 \cdot 10^{45}$$

$\rightarrow [\text{Pb}^{2+}]$ is heel klein.

13. 1 ppm = 1 mg/L in water.

$$1 \text{ mol Cu} = 63,55 \text{ g} = 63550 \text{ mg}$$

$$1 \text{ mol Fe} = 55,85 \text{ g} = 55850 \text{ mg}$$

$$1 \text{ M} = 63550 \text{ ppm Cu}$$

$$1 \text{ M} = 55850 \text{ ppm Fe}$$

$$1 \text{ ppm} = 1,57 \cdot 10^{-5} \text{ M Cu}$$

$$1 \text{ ppm} = 1,79 \cdot 10^{-5} \text{ M Fe}$$

oplossingen 10 x verdund

$$A1 \rightarrow 0,0210537 \text{ mol Cu} / 0,02058 \text{ mol Fe} \cdot 100\% = 102,3\%$$

$$A2 \rightarrow 103,3\%$$

$$A3 \rightarrow 84,35\%$$

$$B1 \rightarrow 241,9\%$$

$$B2 \rightarrow 131,5\%$$

$$B3 \rightarrow 21,7\%$$