

CORRECTION SUJET N°2

Épreuve: Procédés de Traitement des eaux

Exercice -1 (08 pts)

1) Calcul de Q_F :

$$Q_F = Q_{eb} + Q_{rec} \quad (0,5)$$

A.N: $Q_F = 350 + 130$

$$\boxed{Q_F = 480 \text{ L/h}} \quad (0,25)$$

2) Calcul du taux de conversion γ :

$$\gamma = \frac{Q_P}{Q_{eb}} \text{ ou } = \frac{Q_P}{Q_{ali}} \quad (0,5)$$

A.N: $\gamma = \frac{300}{350} = 85,7\% \quad (0,5)$
ou $\gamma = \frac{300}{480} = 62,5\% \quad (0,25)$

Les 2 solutions sont indispensables

3) R_m ? P_s ? F_c ?

Il faut établir un certain nombre d'équations de bilans de matière:

$$Q_{ali} = Q_{eb} + Q_{rec} \quad (0,5)$$

$$Q_{eb} = Q_c + Q_P \Rightarrow Q_c = Q_{eb} - Q_P \quad (0,5)$$

A.N: $Q_c = 350 - 300 = 50 \text{ L/h} \quad (0,25)$

Par rapport aux flux:

$$Q_{rec} \times C_{rec} + Q_c \times C_c + Q_P \times C_P = Q_{ali} \times C_{ali} = C_{eb} \times C_{eb} + Q_{Pa} \times C_{Pa}$$

$$C_c = \frac{\Phi_{eb} \times C_{eb} \times P}{\Phi_c} = \frac{350 \times 1,5 - 300 \times 10^{-2}}{50} = 10,44 \text{ mol/L}$$

$$C_{Ali} = \frac{\Phi_{eb} \times C_{eb} + \Phi_{rec} \times C_{dec}}{480} = \frac{350 \times 1,5 + 130 \times 10,44}{480}$$

$$R_m = 1 - \frac{C_p}{C_{Ali}} = 1 - \frac{0,01}{3,92} = 0,25$$

$$R_m = 99,75\%$$

$$P_s = \frac{C_p}{C_{Ali}} = \frac{0,01}{3,92} = 0,25\%$$

$$P_s = 0,25\%$$

$$F_c = \frac{C_{rec}}{C_{Ali}} = \frac{10,44}{3,9} = 2,66$$

$$F_c = 2,66$$

Exercice 02 (06 points)

$$2) \Phi_m = \frac{[PO_4^{3-}]}{M(PO_4^{3-})} \times \Phi = \frac{10,32}{95} \times 528 = 57,35 \text{ mol/h}$$

$$\frac{Fe}{P} = 1,5 \Rightarrow Fe = 1,5 \times P$$

$$\text{ou : } Fe = 1,5 \times PO_4^{3-}$$

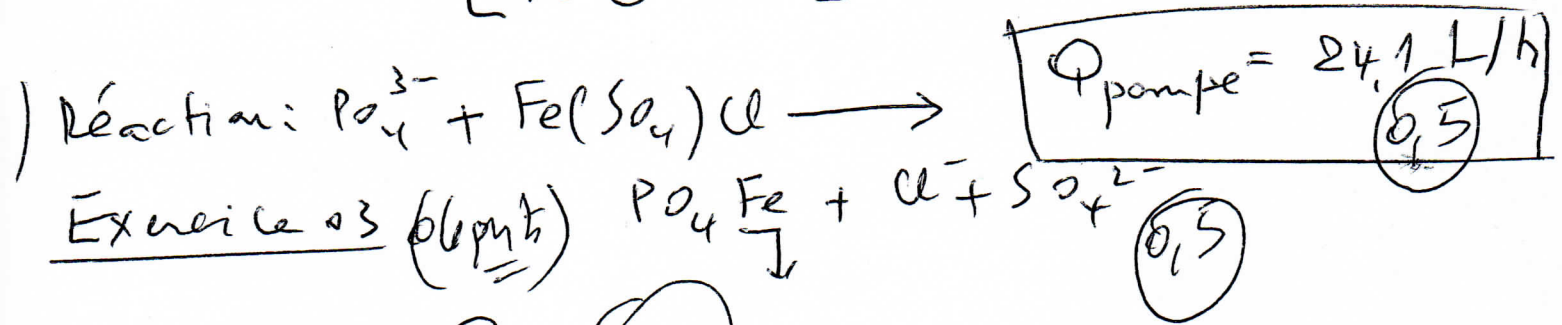
$$\text{Flux de Fe} = 1,5 \times \text{Flux de P}$$

$$= 1,5 \times 57,5 = 86,02 \text{ mol/L}$$

Le chlorure présente un [] en Fe^{3+} =

$$\frac{\text{Densité} \times \text{puissance}}{187,5} = \frac{1540 \times 9435}{187,5} = 3,57 M$$

$$\Phi_{\text{pompe}} = \frac{\text{Flux de Fe}^{ST}}{[\text{Fe}^{ST} \text{ Jani ton}]} \Rightarrow \Phi_{\text{pompe}} = \frac{86,04}{3,57}$$



$$\Phi_p = C_p \times \Phi_m$$

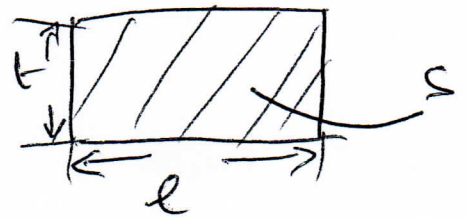
$$C_p = 1,5 + \frac{2,5}{\sqrt{\Phi_m}} = 1,5 + \frac{2,5}{\sqrt{34,72}} = 1,924$$

$$\Phi_p = 1,924 \times 125 = 240,5 \text{ m}^3/\text{h}$$

$$\Phi_p = 0,0688 \text{ m}^3/\text{s}$$

$$S = \frac{\Phi_p}{V \cdot O \cdot C} = \frac{0,668}{0,5 \times 0,555 \times 0,5} = 0,48 \text{ m}^2$$

$$\left\{ \begin{array}{l} O = \frac{2,5}{2,5 + 2} = 0,555 \\ V = 0,5 \text{ m/s} \\ C = 0,5 \end{array} \right.$$



$$S = t \times l$$

$$t = 0,4 \text{ m en prenant } 1 \text{ E.H} = 200 \text{ L/j}$$

$$l = \frac{S}{t} = \frac{0,48}{0,4}$$

$$l = 1,2 \text{ m}$$