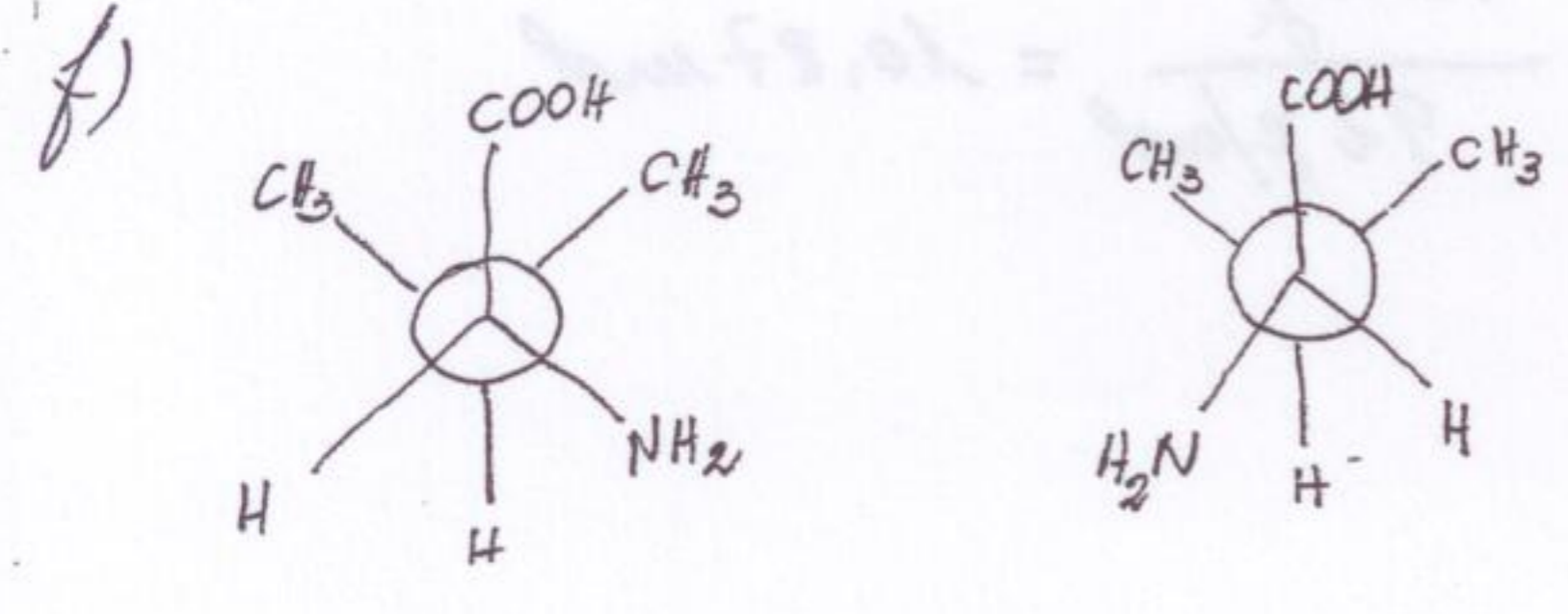
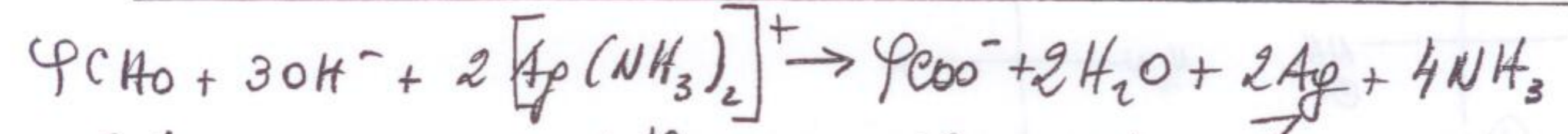
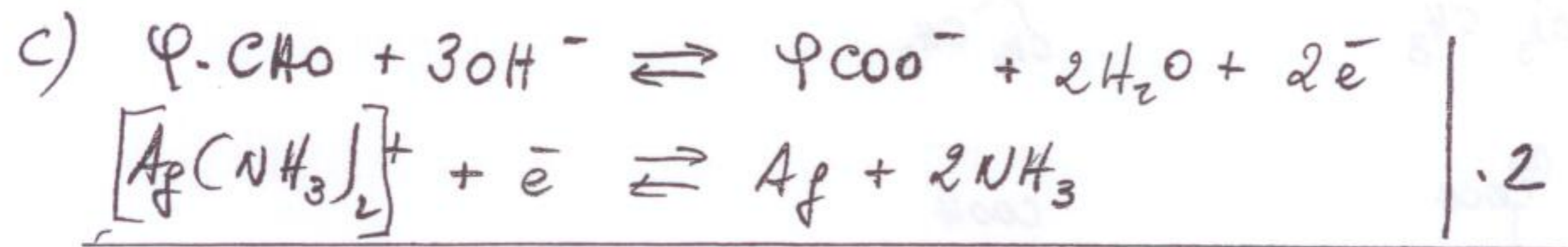
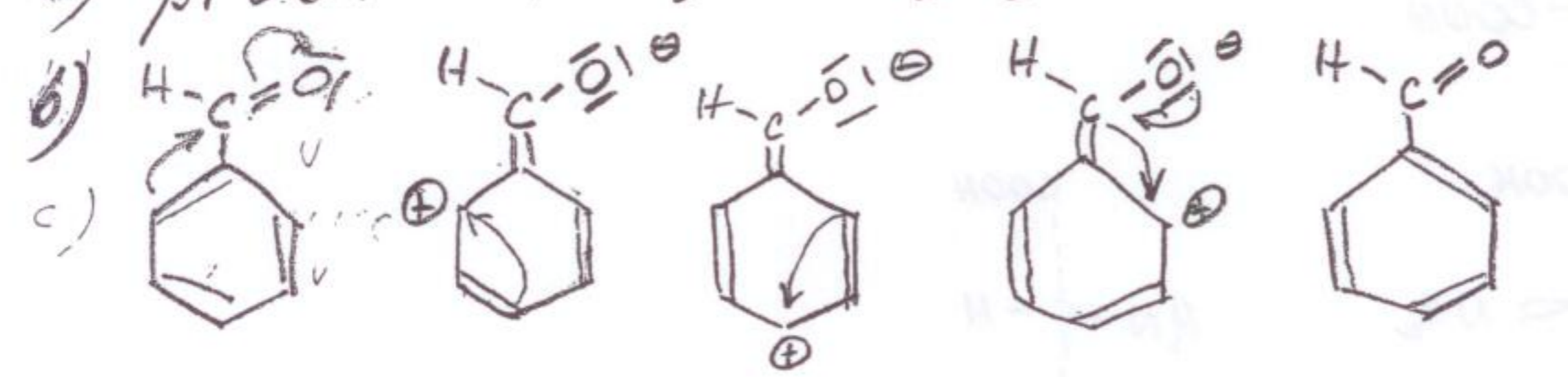
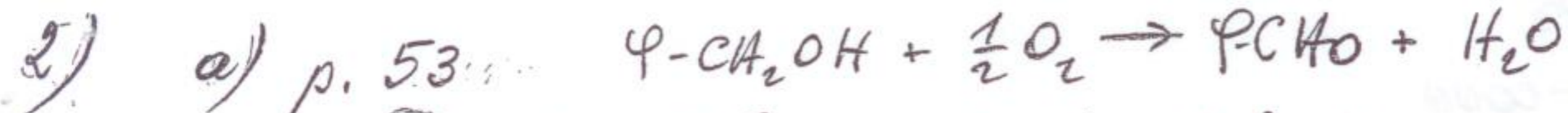


d) R  
e) expérience balancée!



g) MH 117 
$$\frac{26 \text{ g}}{117 \text{ g mol}^{-1}} = 0,22 \text{ mol } (-) \text{ contre } 0,13 \text{ mol } (+)$$

⇒ excès de (-) ⇒ lévogyre



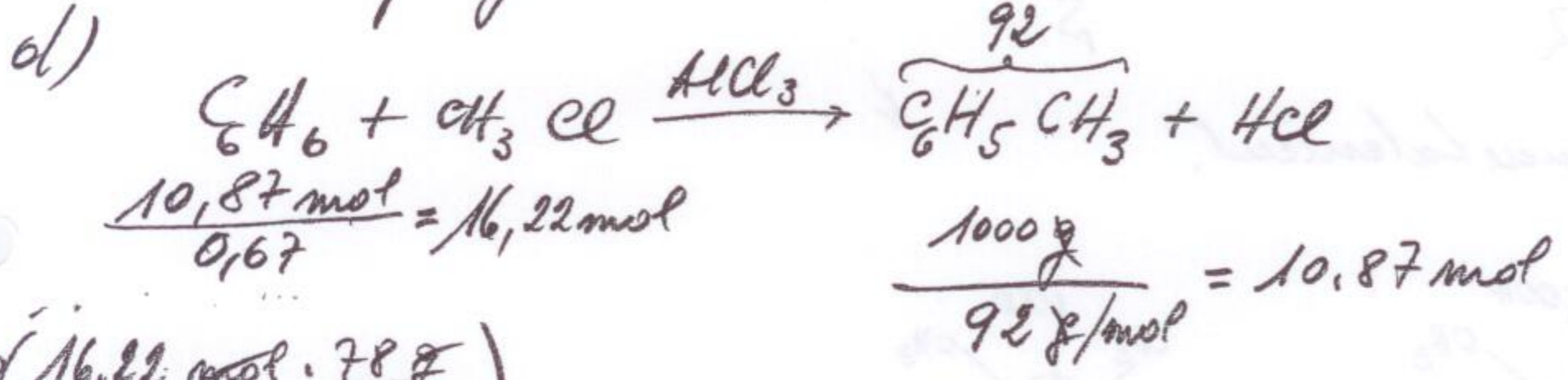
\* (Merck Index 10<sup>th</sup> edit. N° 1054)

$\varphi\text{COO}^-$  = anion benzoate (AT page 66)

3) a) p. 46

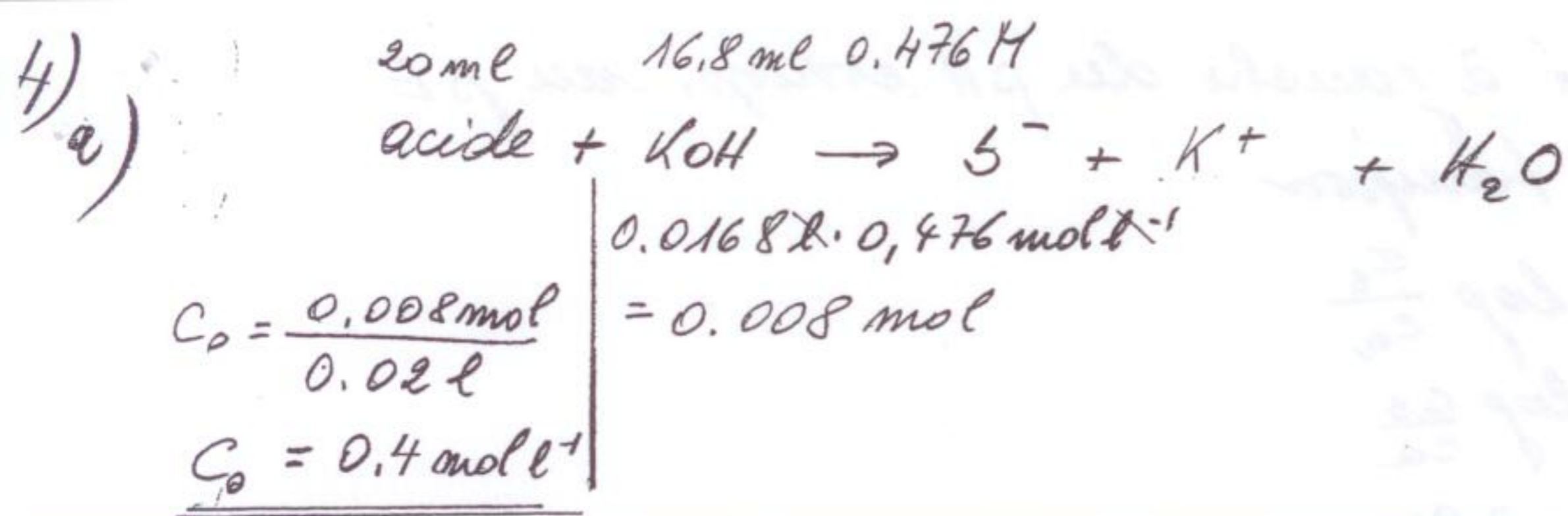
b) exercice page 48

c) exercice page 48



$\Rightarrow \left( \frac{16,22 \text{ mol} \cdot \frac{78 \text{ g}}{\text{mol}}}{878 \text{ g/l}} \right)$

= 1,44 l



b)  $pK_a = 4,1$

---

c)  $\frac{C_0 x^2}{1-x} = 10^{-4,1} = 7,94 \cdot 10^{-5}$

$$0,4 x^2 = 7,94 \cdot 10^{-5} - 7,94 \cdot 10^{-5} x$$

$$0,4 x^2 + 0,0000794 x - 0,0000794 = 0$$

$$x = 0,0139 \text{ soit } 1,4\%$$


---

d)  $\frac{x^2}{C_0 - x} = 10^{-4,1} = 7,94 \cdot 10^{-5}$  (acide faible)

$$x = [H_3O^+] = 0,0056$$

$$pH = -\log 0,0056$$

$$pH = \underline{\underline{2,25}}$$


---

e)  $HClO_4$  ac. fort A

$$pH = -\log 0,4$$

$$pH = \underline{\underline{0,40}}$$


---

f) pE: solution 0,008 mol  $B^-$  / 36,8 ml

$$C_0 = 0,22 \text{ mol l}^{-1} \text{ (base faible)}$$

$$\frac{x^2}{C_0 - x} = K_b = 10^{-9,9} = 1,26 \cdot 10^{-10}$$

$$x = [OH^-] = 7,1 \cdot 10^{-6}$$

$$pOH = -\log 7,1 \cdot 10^{-6} = 5,15$$

$$pH = \underline{\underline{8,85}}$$

g) pH=5 situé à gauche de pH corresp. au pE  
⇒ sol. tampon

$$\text{pH} = \text{pK}_A + \log \frac{c_b}{c_a}$$

$$5 = 4.1 + \log \frac{c_b}{c_a}$$

$$\log \frac{c_b}{c_a} = 0.9 = 7.94$$

$$\frac{c_b}{c_a} = 7.94 \Rightarrow c_b = 7.94 c_a$$

$$\text{or } c_a + c_b = 0.4 \text{ (mol/l)}$$

$$c_a = 0.4 - c_b$$

$$\text{donc: } c_b = 7.94(0.4 - c_b)$$

$$c_b = 0.356 \text{ mol l}^{-1}$$

$$c_a = 0.044 \text{ mol l}^{-1}$$

h)  $a + \text{KOH} \rightarrow b^- + \text{K}^+ + \text{H}_2\text{O}$  à droite du pE → <sup>solution de</sup> base fo.

$$\text{pH} = 13 \Rightarrow \text{pOH} = 1 \Rightarrow c_{\text{KOH}} = 0.1 \text{ mol l}^{-1}$$

(excès KOH.)

$$c_0 = 0.1 \text{ mol l}^{-1} = \frac{n_{\text{KOH}}}{\text{vol. tot.}} = \frac{0.476 \frac{\text{mol}}{\text{g}} \cdot x \text{ g}}{(0.0368 + x) \text{ l}}$$

$$0.476 x = 0.1(0.0368 + x)$$

$$0.476 x = 0.00368 + 0.1x$$

$$0.376 x = 0.00368$$

$$x = 0.0098 \text{ l i. e. } 9.8 \text{ ml}$$

$$V_{\text{tot}} \text{ à ajouter: } 16.8 + 9.8 = 26.6 \text{ ml } \checkmark$$

5) a) page 55

b) " 56

c) " 56 + 57

d) " 59

e) " 59