

$$K_A = \frac{[HCOO^-]_{\acute{e}q} [H_3O^+]_{\acute{e}q}}{[HCOOH]_{\acute{e}q}} \quad -2$$

$$pK_A = -\log K_A = -\log \frac{[HCOO^-]_{\acute{e}q}}{[HCOOH]_{\acute{e}q}} - \log [H_3O^+]_{\acute{e}q} = -\log \frac{[HCOO^-]_{\acute{e}q}}{[HCOOH]_{\acute{e}q}} + pH \quad -3$$

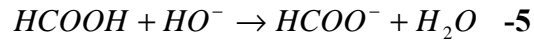
$$\cdot pH = pK_A + \log \frac{[HCOO^-]_{\acute{e}q}}{[HCOOH]_{\acute{e}q}} \quad \text{اذن} \quad -4$$

1-4 : يمثل تغيرات نسبة الحمض و 2: يمثل تغيرات نسبة القاعدة

$$pK_A = 3,75 \quad \text{اذن} \quad \% A = \% B \quad \text{لدينا} \quad pH = pK_A \quad -2-4$$

$$\cdot \frac{[HCOO^-]}{[HCOOH]} = 10^{pH - pK_A} = 10^{3-3,75} = 0,18 \quad \text{ط} \quad 1:1 \quad -3-4$$

$$\cdot \frac{[HCOO^-]}{[HCOOH]} = \frac{\% B}{\% A} = \frac{16\%}{84\%} = 0,19 \quad \text{ط} \quad 2:1 \quad \text{مبانيا}$$



$$K = \frac{K_A (HCOOH / HCOO^-)}{K_A (H_2O / HO^-)} = \frac{10^{-3,75}}{10^{-14}} = 1,78 \cdot 10^{10} \quad -6$$

$$V_{BE} = 22,4 \text{ mL}, \quad pH_E = 8 \quad -7$$

$$C_A V_A = C_B V_{BE} \Rightarrow C_A = \frac{C_B V_{BE}}{V_A} = 1,12 \cdot 10^{-2} \text{ mol.L}^{-1} \quad \text{عند التكافؤ} \quad -8$$

تمرين 2:

$$u_R + u_C = E \Rightarrow Ri + u_C = E \Rightarrow RC \frac{du_C}{dt} + u_C = E \quad -1$$

$$-2 \quad \text{لدينا} \quad \frac{du_C}{dt} = A \alpha e^{-\alpha t} \quad \text{نعوض في المعادلة فنجد} :$$

$$RCA \alpha e^{-\alpha t} + A - A e^{-\alpha t} = E \Rightarrow A e^{-\alpha t} (RC \alpha - 1) = E - A$$

$$\Rightarrow RC \alpha - 1 = 0 \quad \text{et} \quad E - A = 0$$

$$\Rightarrow \alpha = \frac{1}{RC} = \frac{1}{\tau} \quad \text{et} \quad A = E$$

$$\Rightarrow u_C(t) = E(1 - e^{-t/\tau})$$

$$1 - e^{-t/\tau} = \frac{u_C}{E} \Rightarrow e^{-t/\tau} = 1 - \frac{u_C}{E} \Rightarrow \frac{-t}{\tau} = \ln(1 - \frac{u_C}{E})$$

$$\Rightarrow \tau = \frac{-t}{\ln(1 - \frac{u_C}{E})} = \frac{-4,08 \cdot 10^{-3}}{\ln(1 - \frac{4,02}{12})} = 10 \text{ ms} \quad -3$$

$$\tau = RC \Rightarrow C = \frac{\tau}{R} = 5 \cdot 10^{-6} \text{ F} \quad -4$$

$$E_e = \frac{1}{2} C u_C^2 = \frac{1}{2} 5 \cdot 10^{-6} * 12^2 = 3,6 \cdot 10^{-4} \text{ J} \quad -5$$

-6 الدارة المثالية LC

$$u_C + u_L = 0 \Rightarrow \dots \Rightarrow \frac{d^2 q}{dt^2} + \frac{1}{LC} q = 0 \quad -7$$

$$T_0 = 2\pi \sqrt{LC} = 2,95 \cdot 10^{-3} \text{ s} \quad -8$$

$$i(t) = \frac{dq}{dt} = -\frac{2\pi}{T_0} Q_m \sin(\frac{2\pi}{T_0} t + \varphi) \quad -9$$

$$i(0) = 0 \text{ et } q(0) = CE = 6.10^{-5} C \text{ -10}$$

$$i(0) = -\frac{2\pi}{T_0} Q_m \sin \varphi \text{ et } q(0) = Q_m \cos \varphi \text{ -11}$$

$$\varphi = 0 \text{ et } Q_m = CE \text{ -12}$$

$$E_m = 3,6.10^{-4} J \text{ لأن الطاقة تحفظ. -13}$$

-14

$$T_0' = 20 ms \text{ -أ}$$

$$C = \frac{1}{L} * \left(\frac{T_0'}{2\pi}\right)^2 = 230 \mu F \text{ -ب}$$

$$E' = \sqrt{\frac{2E(0)}{C'}} = 6 V$$

$$.E_m(10) = 0J \text{ -15}$$

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