

$$K_A = \frac{[HCOO^-]_{\text{éq}} [H_3O^+]_{\text{éq}}}{[HCOOH]_{\text{éq}}} \quad -2$$

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

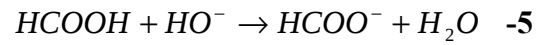
$$. pH = pK_A + \log \frac{[HCOO^-]_{\text{éq}}}{[HCOOH]_{\text{éq}}} \quad \text{اذن} \quad -4$$

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

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

$$\frac{[HCOO^-]}{[HCOOH]} = 10^{pH - pK_A} = 10^{3-3,75} = 0,18 \quad \text{ط1} \quad -3-4$$

$$\frac{[HCOO^-]}{[HCOOH]} = \frac{\%B}{\%A} = \frac{16\%}{84\%} = 0,19 \quad \text{ط2} \quad \text{مبيانيا}$$



$$K = \frac{K_A (HCOOH / HCOO^-)}{K_A (H_2O / HO^-)} = \frac{10^{-3,75}}{10^{-14}} = 1,78.10^{10} \quad -6$$

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

$$C_A V_A = C_B V_{BE} \Rightarrow C_A = \frac{C_B V_{BE}}{V_A} = 1,12.10^{-2} \text{ mol.L}^{-1} \quad \text{عند التكافؤ} \quad -8$$

تمرين 2:

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

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

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

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

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

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

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

$$\Rightarrow \tau = \frac{-t}{\ln(1 - \frac{u_C}{E})} = \frac{-4,08.10^{-3}}{\ln(1 - \frac{4,02}{12})} = 10 \text{ ms} \quad -3$$

$$\tau = RC \Rightarrow C = \frac{\tau}{R} = 5.10^{-6} \text{ F} \quad -4$$

$$E_e = \frac{1}{2} Cu_C^2 = \frac{1}{2} 5.10^{-6} * 12^2 = 3,6.10^{-4} \text{ J} \quad -5$$

الدارة المثالية LC -6

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

$$T_0 = 2\pi\sqrt{LC} = 2,95.10^{-3} \text{ s} \quad -8$$

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

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

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

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

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

-14

$$T_0' = 20 ms \quad \text{أ-}$$

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

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

$$E_m(10) = 0 J \quad -15$$

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