

-
:   3 :

( 3 ) :

$$0,5 \dots \dots \dots \frac{1}{V} \dots \dots \dots v = \frac{dx}{dt} = d[I_2] / dt \quad - / 1$$

$t=0\text{min}$

$$v(0\text{min}) = AB / OB$$

1.....

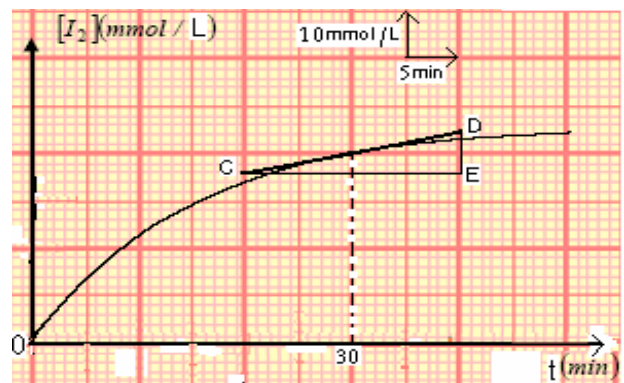
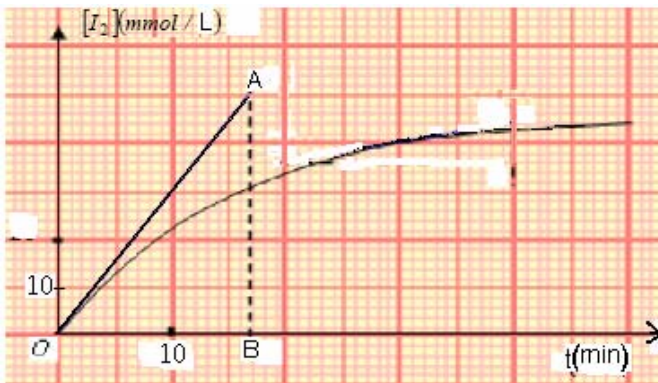
$$v(0\text{min}) = 50 / 17 = 2,94 \text{ mmol/l.min}$$

(30min) = DE/CE v :

$t=30\text{min}$

1.....

$$v(30\text{min}) = 8 / 20 = 0,4 \text{ mmol/l.min}$$



$t = 30\text{min}$

- 2

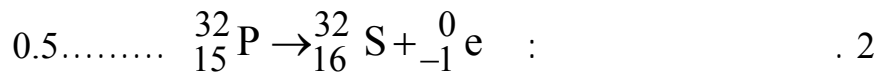
$$0,5 \dots \dots \dots$$

( 6 ) :

0.5..... . A

Z

: . 1



$$0.5 \dots \dots \dots \left\{ \begin{array}{l} P = -\frac{\Delta N}{N} \\ P = \lambda \cdot \Delta t \end{array} \right. : \quad . 3$$

$$\frac{dN}{dt} + \lambda N = 0 : \quad \Delta t \rightarrow 0$$

$$0.25 \dots \dots \dots \frac{dN}{dt} = -\frac{1}{\tau} N_0 \cdot e^{-\frac{t}{\tau}} : \quad N(t)$$

$$-\frac{1}{\tau} N_0 \cdot e^{-\frac{t}{\tau}} + \lambda \cdot N_0 \cdot e^{-\frac{t}{\tau}} = 0 : \quad \frac{dN}{dt} \quad N(t)$$

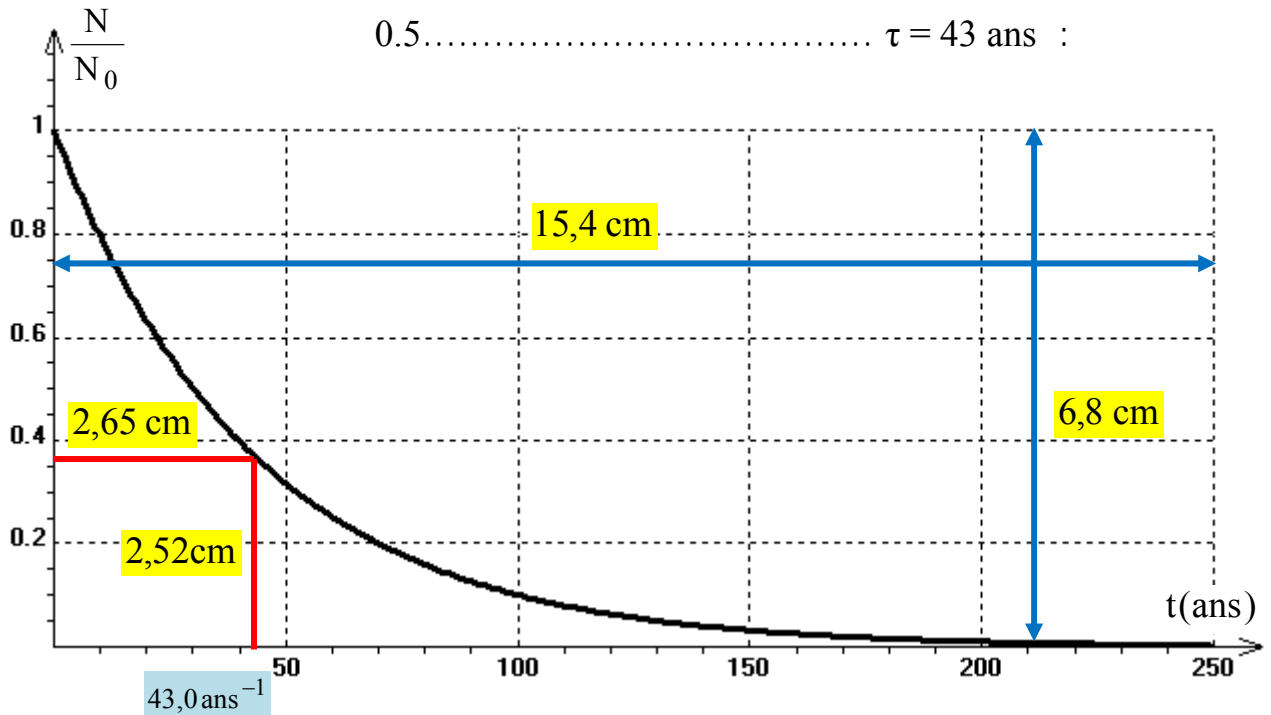
0.25.....  $N_0 \cdot e^{-\frac{t}{\tau} \left( \lambda - \frac{1}{\tau} \right)} = 0 :$

0.5.....  $\lambda = \frac{1}{\tau} :$

$N(t) = N_0 \cdot e^{-\frac{t}{\tau}} : N(t) \quad t = \tau \quad \rightarrow$

0.5.....  $\left( \frac{N}{N_0} \right)_{t=\tau} = 0,37 :$

0.5.....  $\tau = 43 \text{ ans} :$



0.5.....  $\lambda = \frac{1}{\tau} = \frac{1}{43} = 0,023 \text{ ans}^{-1} :$

0.5.....

$N(t) = N_0 \cdot e^{-\frac{t}{\tau}} :$

0.25.....  $\frac{N(t)}{N_0} = e^{-\frac{t}{\tau}} :$

$N(t_{1/2}) = \frac{N_0}{2} : \quad t = t_{1/2}$

0.25.....  $\frac{1}{2} = e^{-\frac{t_{1/2}}{\tau}} :$

0.5.....  $t_{1/2} = \tau \cdot \ln 2 :$

0.5.....  $t_{1/2} = 30 \text{ ans} :$

( 5 )

0.25.....  $H^+$  . 1

:

0.25 + 0.25.....  $H_3O^+_{(aq)} / H_2O_{(l)}$   $CH_3COOH_{(aq)} / CH_3COO^-_{(aq)}$   
0.25..... pH pH . 2

0.25.....  $K = \frac{[H_3O^+]_f \cdot [CH_3COO^-]_f}{[CH_3COOH]_f}$  :

0.25...  $n_1 = CV = 2,7 \cdot 10^{-3} \times 100 \cdot 10^{-3} = 2,7 \cdot 10^{-4} \text{ mol}$  : . 3

1..... : . 4

		$CH_3COOH_{(aq)} + H_2O_{(l)} = CH_3COO^-_{(aq)} + H_3O^+_{(aq)}$			
		( mol )			
	x=0	$2,7 \cdot 10^{-4}$		0	0
	x = x <sub>f</sub>	$2,7 \cdot 10^{-4} - x_f$		x <sub>f</sub>	x <sub>f</sub>

$x_f = [H_3O^+]_f \cdot V$  :  $[H_3O^+]_f = \frac{x_f}{V}$  : . 5

$[H_3O^+]_f = 10^{-pH}$

0.25.....  $x_f = 10^{-pH} \cdot V$  :

0.25.....  $x_f = 10^{-3,7} \times 100 \cdot 10^{-3} = 2 \cdot 10^{-5} \text{ mol.L}^{-1}$  :

$CV - x_{\max} = 0$  : . 6

0.25.....  $x_{\max} = CV$  :

0.25.....  $x_{\max} = CV = 2,7 \cdot 10^{-3} \times 100 \cdot 10^{-3} = 2,7 \cdot 10^{-4} \text{ mol}$  :

0.25.....  $\tau = \frac{x_f}{x_{\max}}$  : . 7

0.25.....  $\tau = \frac{x_f}{x_{\max}} = \frac{2 \cdot 10^{-5}}{2,7 \cdot 10^{-4}} = 0,074$  :

0.25.....  $\tau < 1$

0.25...  $[CH_3COOH_{(aq)}]_f = \frac{2,7 \cdot 10^{-4} - 2 \cdot 10^{-5}}{100 \cdot 10^{-3}} = 2,5 \cdot 10^{-3} \text{ mol.L}^{-1}$  : . 8

$K = \frac{[H_3O^+]_f \cdot [CH_3COO^-]_f}{[CH_3COOH]_f}$  : (2) . 9

0.5.....  $K = \frac{(2 \cdot 10^{-5})^2}{2,5 \cdot 10^{-3}} = 1,6 \cdot 10^{-5}$  :

$pK_a = -\log k_a = -\log 1,6 \cdot 10^{-5} = 4,8$

( 6 ) :

$$\sum \vec{a} = m \vec{F} - 1$$
$$\vec{a} = m \vec{P}$$

0,25..... a=0 : (OX)

0,5.....(1)  $x = V_{0x} \cdot t = V_0 \cos \alpha \cdot t :$

0,25..... a = g : (OY)

0,5.....(2)  $Y = \frac{1}{2} g t^2 - V_0 \sin \alpha \cdot t :$

: 2 .  $t = x / V_0 \cos \alpha : 1$

0,5.....  $Y = g \cdot x^2 / 2 (V_0 \cos \alpha)^2 - x \tan \alpha$

0,5.....  $Y = 0,261 x^2 - 0,577x :$

$Y = 8m - 2$

0,5.....  $4,9t^2 - 2,5t - 8 = 0 : 8 = 4,9t^2 - 2,5t : 2$

0,5.....  $t = 1,56s :$

0,5.....  $x = V_0 \cos \alpha t = 5 \cos 30 \cdot 1,56 = 6,75m - 3$

0,5.....  $Y = \frac{1}{2} g t^2 - V_0 \sin \alpha \cdot t = 4,9(1,56)^2 - 5 \sin 30 \cdot 1,56 = 8m$

0,5.....  $V_x = V_0 \cos 30 = 5 \cos 30 = 4,33m/s - 4$

0,5.....  $V_y = g t - V_0 \sin 30 = 9,8 \cdot 1,56 - 5 \cdot 0,5 = 12,8m/s$

$$V^2 = V_x^2 + V_y^2 = (4,33)^2 + (12,8)^2$$

0,5.....  $V = 13,5m/s$