C_2H_5OH CH_3COOH

$1.40mol$ $1.40mol$

$\theta_1 = 190°C$

$t = 60min$ $t = 0$

$t(min)$	0	60	120	180	240	300	360	420
$n_{acide}(mol)$	1.40	0.8	0.59	0.52	0.48	0.47	0.46	0.46
$n_{ester}(mol)$								

$n_{ester} = f(t)$

$\theta_2 = 100°C$ $n_{ester} = g(t)$

C_2H_5OH CH_3COOH

$n_0(mol)$ $n_0(mol)$ $t = 0$

$$CH_3COOH_{(l)} + C_2H_5 - OH_{(l)} = CH_3COOC_2H_{5(l)} + H_2O_{(l)}$$

$(Na^+ + OH^-)$ (n)

$t(h)$	0	1	2	3	4	5	6	7
$n(mol)$	1.00	0.61	0.45	0.9	0.35	0.34	0.33	0.33
$n'(mol)$								

x_{max}

(n) (n')

$n' = f(t)$

$t = 3h$

(τ_f)

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$10mL$ $4.5mmol$

$10min$ $40℃$

A

V_E $C_b = 0.5\,mol/l$

$t(min)$	0	10	20	30	40	50	60	70	80
$V_E(ml)$	0	2.1	3.7	5	6.1	7.0	7.6	7.8	7.8

V_E n_A

x

$t(min)$	0	10	20	30	40	50	60	70	80
$x(mmol)$									

$x = f(t)$

r

$60℃$ $x = f(t)$

C_2H_5OH CH_3COOH

$$CH_3COOH_{(l)} + C_2H_5OH_{(l)} = CH_3COOC_2H_{5(l)} + H_2O_{(l)}$$

CH_3COOH $0.2mol$

C_2H_5OH $0.2mol$

V_a

$t = 0$

$C = 0.1mol.L^{-1}$ $\left(Na^+ + OH^-\right)$

$\left(V'_{be}\right)$ $\left(V_{be}\right)$

$t(h)$	0	4	8	12	16	20	32	40	48	60
$n'_{be}(mL)$	200	168	148	132	118	104	74	66	66	66
$x(mol)$										

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C_2H_5OH CH_3COOH

(V'_{be}) (n)

(x)

$x = f(t)$

τ

x_f Q_{rf}

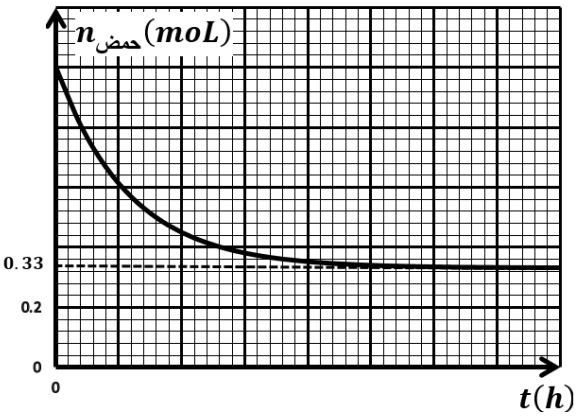
$t = 0s$

$1.0mol$ $1.0mol$

E

E

V

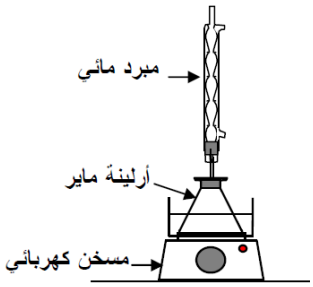


$t = 25h$

-
-
-

K $Q_{réq}$

$0.2mol$



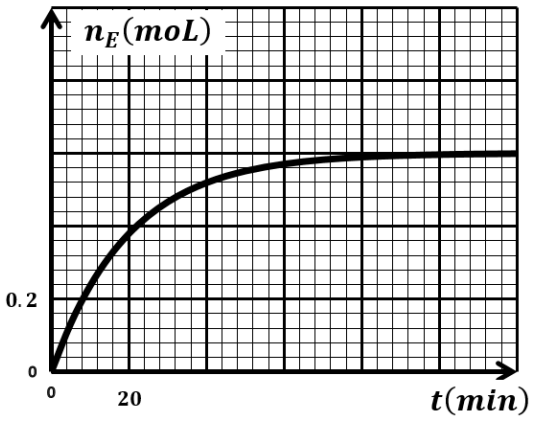
1mol CH_3COOH 1mol

C_4H_9OH

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100°C

$n_E = f(t)$ n_E



$t_2 = 40min$ $t_1 = 20min$

$t_3 = 60min$

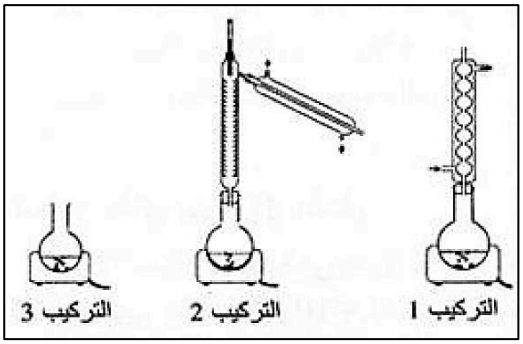
65%

$CH_3 - COO - CH_2 - C_6H_5$

CH_3COOH

$V = 41.6mL$ $m = 24g$

$M = 108g/mol$ $\rho = 1.039g/mL$



CH_3COCl

$t = 0$ C_3H_7OH A

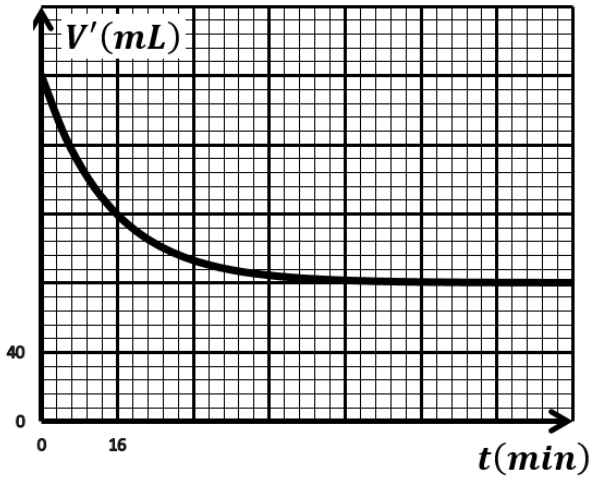
CH_3COOH A

$(Na^+ + OH^-)$ V

V'_{be} V_{be} $C_b = 1mol/L$

$V'_{be} = f(t)$

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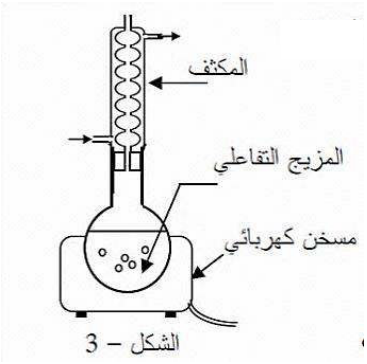
K

A

$0.08mol$ $0.02mol$

$0.2mol$ C_2H_5OH $0.2mol$

CH_3COOH



الشكل – 3

$K = 4$

$0.2mol$

$2mol$ (S)

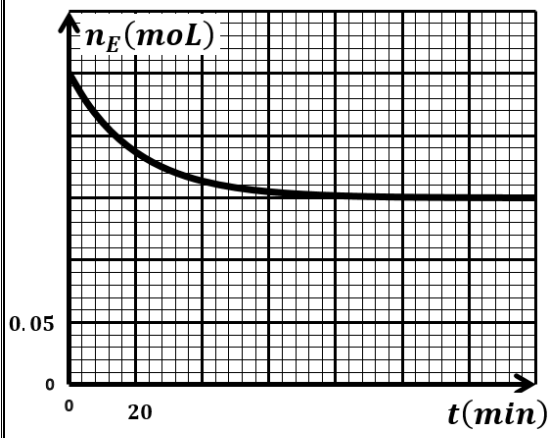
$2moL$ $CH_3COOC_3H_7$

$10min$ $40°C$

A

V_E

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τ_f

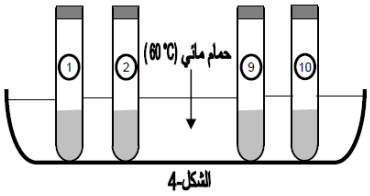
K

$0.5mol$ (S)

$m_0 = 38.4g$ C_2H_5OH $n_0 = 0.4mol$ $t = 0$

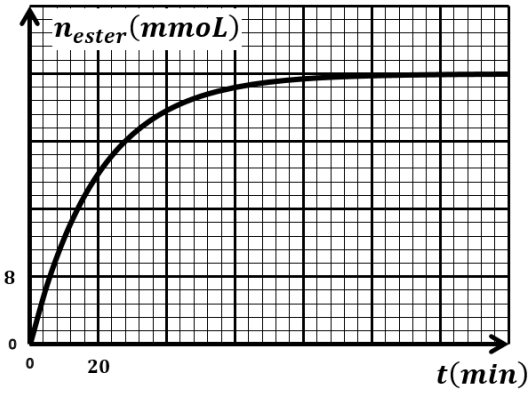
$C_nH_{2n+1}COOH$

60°C



الشكل-4

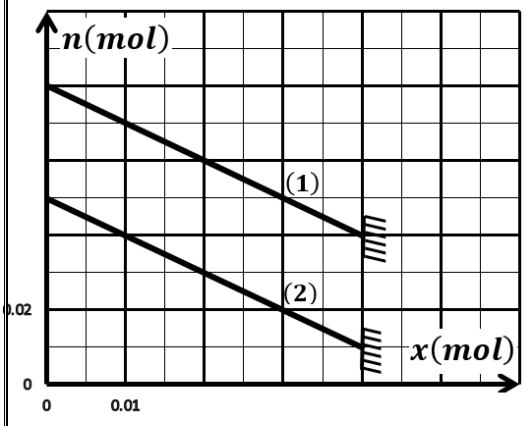
$n_E = f(t)$



$K = 4$

t = 120min

$M(C) = 12\ g/mol$ $M(O) = 16\ g/mol$ $M(H) = 1\ g/mol$



n_1 $t = 0$

C_3H_7OH n_2 CH_3COOH

(2) (1)

x (1)

x (2)

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τ_f

K

n pH

$C = 0.5mol/L$ $(Na^+ + OH^-)$

4,8 pH $V = 10mL$

$pKa = 4,8$ (CH_3COOH/CH_3COO^-) $Ke = 10^{-14}$ $\theta = 25°$

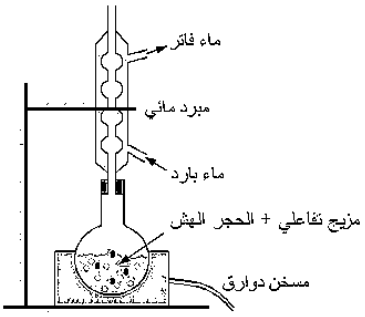
n

Ke Ka K

K

CH_3COOH $0.1mol$ C_4H_9OH $0.1mol$

$V_E = 16.5ml$ $c = 2\,mol/l$



$0.1mol$

$0.1mol$

$13.1ml$

$\rho_E = 0.88\,g/cm^3$

$H = 1\,g$ $6\,g/mol$

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