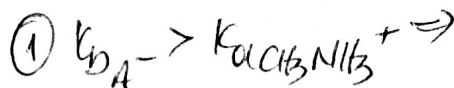


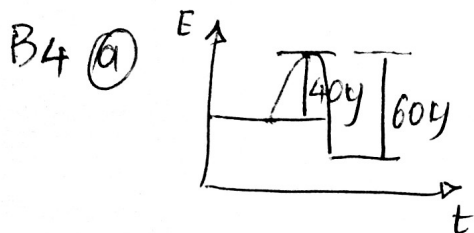
$\text{pH} = 9$ (25°C) $\Rightarrow$
 $\text{pH} = 10$

$\alpha \propto \text{OH}^- > \text{H}_3\text{O}^+ \Rightarrow$



$\frac{K_{\text{bA}^-}}{K_{\text{aHA}}} > \frac{K_{\text{bCH}_3\text{NH}_2}}{K_{\text{aCH}_3\text{NH}_3^+}} \Rightarrow K_{\text{aHA}} < K_{\text{bCH}_3\text{NH}_2}$

① $K_{\text{aHA}} < 10^{-4}$



$\alpha \propto \Delta H = -20y$ (εζοδφρμν)



① $\frac{6}{2} \frac{4}{2} \frac{2}{2}$

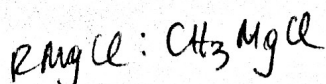
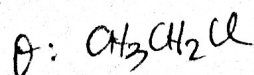
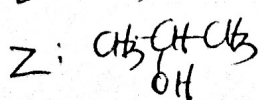
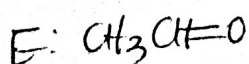
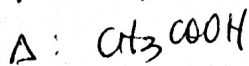
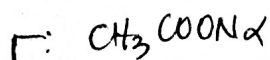
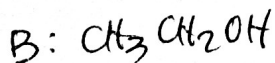
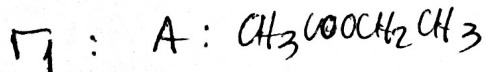
$K_1 = \frac{k_1}{k_2} = \frac{2}{1} = 2$

$\alpha \propto k_1 = 2k_2$ (ii)



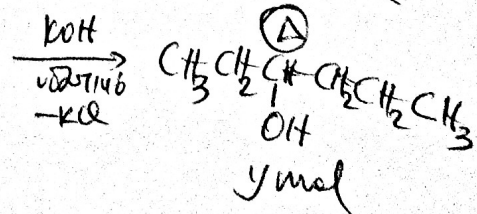
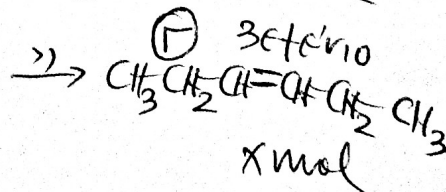
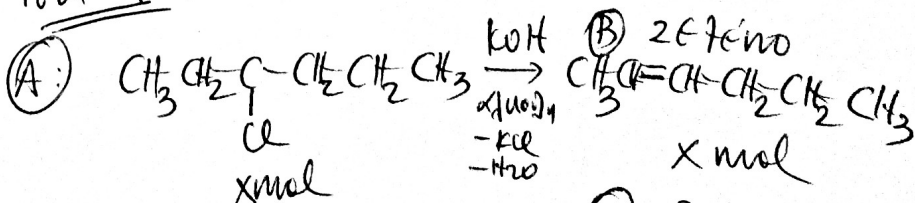
$k_c \downarrow \Rightarrow k_c < 2 \Rightarrow \frac{k_1}{k_2} < 2$ (i)

(Γ2)



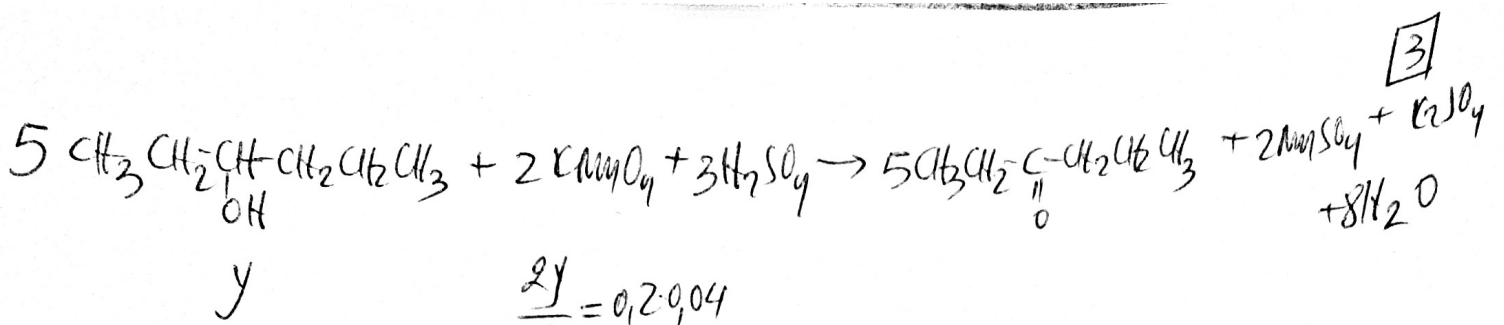
1x8

Τα Β, Γ (αλκένια) παρατηρούνται έχοντας ίσες ταίρες οπότε οι C διπλά βουν C που α έχουν ίσα H.



$4 \times 1 = 4$ τύποι

1: οξείδωση
 1: εφύπνυ,
 1: ποσοστό



$$\frac{2y}{5} = 0,2004$$

άρα $y = 0,02$ μόρια

$$2x + y = 0,1 \Rightarrow x = 0,04$$

40% A → B (0,1 mol A είναι 0,04 mol B 0,04 mol Γ 0,02 mol Δ)
 40% A → Γ
 20% A → Δ

100
 40%
 40%
 20%

Γ3 $\text{C}_x\text{H}_{2x} + 2$ 1 αλκ + 1 αιθ
 $x \text{ mol}, y \text{ mol}$ ή 2 αλκυόλες

$$(x+y) \cdot M_r = 72$$

$$(x+y)(14x+18) = 72 \quad (1)$$

(1)

1^ο πέρος
 $\frac{x}{2} \text{ mol}, \frac{y}{2} \text{ mol}$

$$\text{ROH} + \text{Na} \rightarrow \text{RONa} + \frac{1}{2} \text{H}_2$$

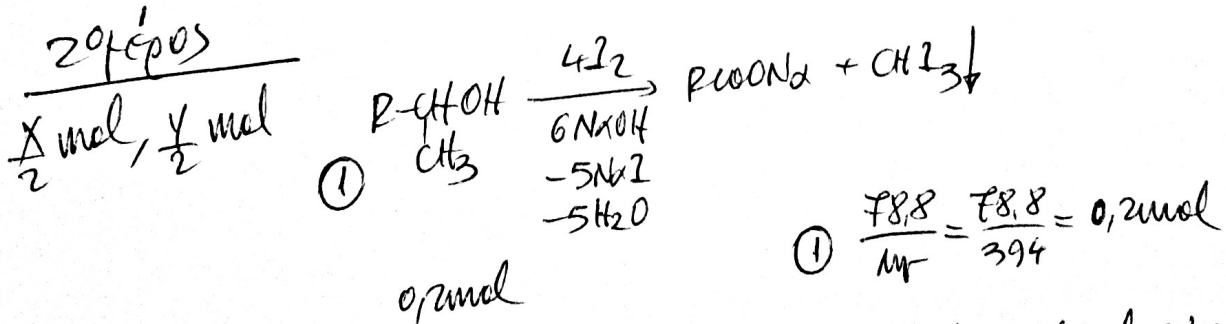
$$\frac{x}{4} = \frac{6720}{22400} = 0,3 \Rightarrow x = 1,2$$

(1 αλκ + 1 αιθ)

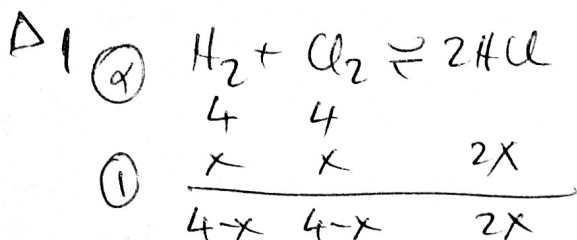
(1) $\frac{x}{2}$
 (1) $\frac{x+y}{2}$

$$\frac{x+y}{4} = 0,3 \Rightarrow x+y = 1,2$$

(2 αλκυόλες)



Αν είχα 1 αλκ + 1 αιθ → θα είχατε να είχα $\frac{x}{2}$ ή $\frac{y}{2} = 0,6 \text{ mol}$ αλκυόλης στο 2^ο πέρος
 οπότε θα παράγονταν 0,6 mol ιώμα, που δεν συμβαίνει (1)
 Άρα έχω 2 αλκυόλες, και πια αν' αυτές δίνω με διαφορετική, έχοντας 0,2 mol στο 2^ο πέρος άρα και στο 1^ο. Οπότε $\frac{x}{2} = 0,2 \Rightarrow x = 0,4$
 και $x+y = 1,2 \Rightarrow y = 1,2 - 0,4 = 0,8$ (1)
 Από (1) $\Rightarrow 14x+18 = \frac{72}{x+y} = \frac{72}{1,2} = 60 \Rightarrow x = 3$ Άρα: 0,4 mol $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ (1)
 0,8 mol $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$

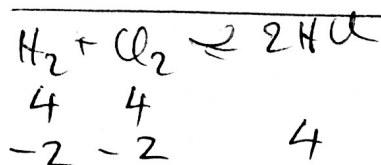


$$4 = \frac{(2x)^2}{(4-x)^2} = \left(\frac{2x}{4-x}\right)^2 \Rightarrow$$

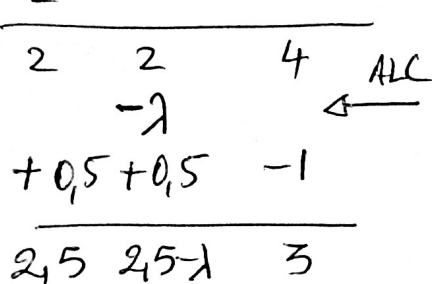
$$\frac{2x}{4-x} = 2 \Rightarrow x = 4-x \Rightarrow x = 2$$

① $\alpha_{H_2} = \alpha_{Cl_2} = \frac{2}{4} = 0,5 \text{ ή } 50\%$
(66 ερωτ. αναλογία)

β)



$$\eta_{HCl}(xI_2) = 4 - \frac{25 \cdot 4}{100} = 4 - 1 = 3 \quad \text{①}$$



$$K_c = 4 = \frac{3^2}{2,5 \cdot 2,5 - 1} = \frac{9}{2,5 \cdot (2,5 - 1)} \Rightarrow$$

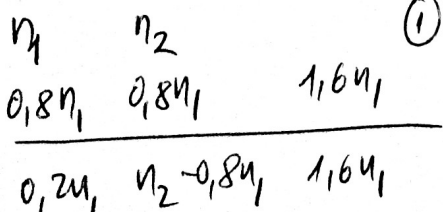
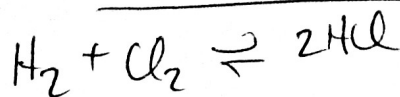
①

$$\lambda = 1,6$$

συνημνή απόδοση με βάση το Cl_2 : $\alpha_{Cl_2} = \frac{2-0,5}{4-1,6} = \frac{1,5}{2,4} = \frac{155}{248} \text{ ή }$

ή αναλλοίωτα $\alpha_{HCl} = \frac{\text{πραγματικό ποσό}}{\text{θεωρητικό ποσό (με βάση το } Cl_2)} = \frac{3}{2 \cdot 2,4} = \frac{5}{8} = 62,5\%$

γ)

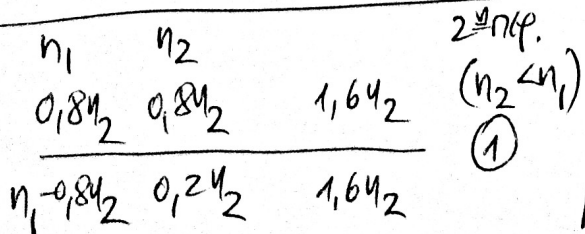


$$K_c = 4 = \frac{1,6^2 \eta_1^2}{0,2\eta_1 \cdot (\eta_2 - 0,8\eta_1)} \Rightarrow \eta_2 = 4\eta_1 \text{ (Δεύτερη λύση)}$$

①

$$\alpha' \rho \alpha \left[\frac{\eta_1}{\eta_2} = \frac{1}{4} \right]$$

Εστω H_2 66
Ελάχιστο
ή ορεκτικά
66 ερωτ. αναλογία
($\eta_2 \geq \eta_1$)

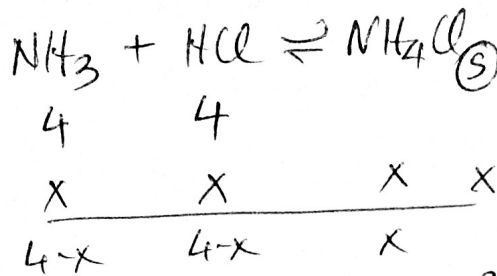


$$K_c = 4 = \frac{1,6^2 \eta_2^2}{0,2\eta_2 \cdot (\eta_1 - 0,8\eta_2)} \Rightarrow \eta_1 = 4\eta_2 \text{ (Δεύτερη λύση)}$$

① $\alpha' \rho \alpha \left[\frac{\eta_1}{\eta_2} = \frac{4}{1} \right]$

A2 (α)

10L



$$\Delta H = 1 \cdot (-315) - 1 \cdot (-45) - 1 \cdot (+90) \quad (5)$$

$$\Delta H = -315 + 45 + 90 = -180 \text{ kJ}$$

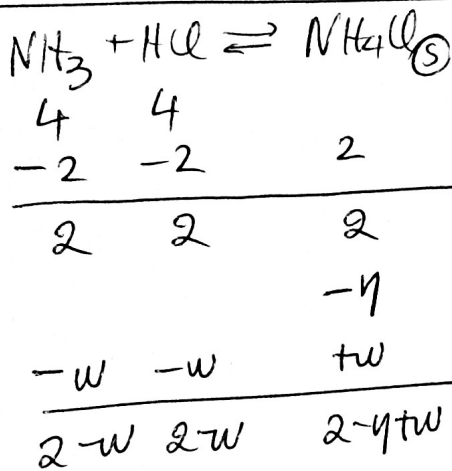
$$x \cdot 180 = 9 \text{ (Ergonomia)}$$

$$K_c = 25 = \frac{1}{\frac{4-x}{10} \cdot \frac{4-x}{10}} \Rightarrow \left(\frac{4-x}{10}\right)^2 = \frac{1}{25} \Rightarrow \frac{4-x}{10} = \frac{1}{5} \Rightarrow x = 2$$

$$\alpha_{\text{NH}_3} = \alpha_{\text{HCl}} = \frac{x}{4} = \frac{2}{4} \text{ ή } 50\% \quad (1)$$

(66-70% αναμειγνύεται) $2 \cdot 180 = 360 \text{ kJ}$

(B)



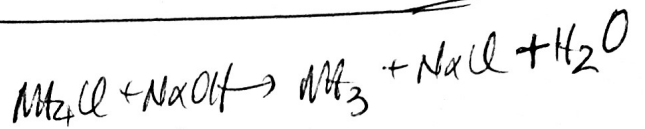
10L → 4L

ALC ↓ V
→

$$(1) K_c = 25 = \frac{1}{\left(\frac{2-w}{4}\right)^2} \Rightarrow \frac{2-w}{4} = \sqrt{\frac{1}{25}} = \frac{1}{5}$$

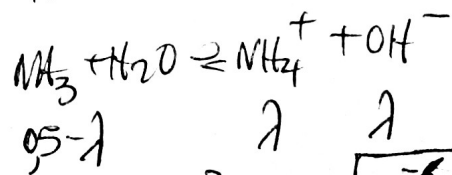
$$2-w = 0,8 \Rightarrow \boxed{w = 1,2}$$

$$(1) \alpha_{\text{Cl}} = \frac{w+2}{4} = \frac{1,2+2}{4} = \frac{3,2}{4} = 0,8 \text{ ή } 80\%$$



$$\eta = \eta' = 0,508 = 0,4 \text{ mol}$$

$$\text{Ερω } \eta = 0,04 \quad \text{76% } \alpha_{\text{NH}_3} : C = \frac{0,4}{0,8} = 0,5 \text{ M}$$



$$0,5 - \lambda \quad \lambda \quad \lambda$$

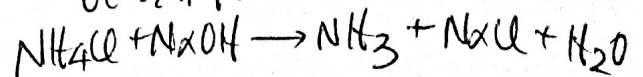
$$K_b \approx \frac{\lambda^2}{0,5} \Rightarrow \lambda = \sqrt{5 \cdot 10^{-6}} = 5 \cdot 10^{-3}$$

$$\text{pOH} = 3 - \log \sqrt{5}$$

$$\text{pH} = 11 + \log \sqrt{5} > 9 \quad (1)$$

άρα για να έχω pH=9

πρέπει να έχω NH₄Cl, οπότε να μην
66-70% αναμειγνύεται.



η	0,4	0,4	0,4	0,4
0,4	0,4	0,4	0,4	0,4

$$\eta = 0,4 \quad \phi \quad 0,4 \quad 0,4 \quad | \quad V = 0,8 \text{ L}$$

$$\text{P.Δ} \quad C_{\text{Cl}} = \frac{\eta - 0,4}{0,8} \text{ M}, \quad C_{\text{b}} = \frac{0,4}{0,8} \text{ M}$$

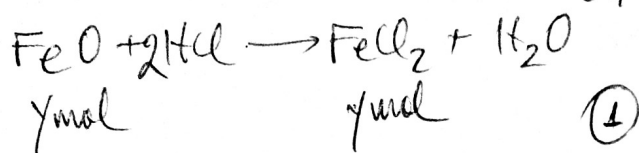
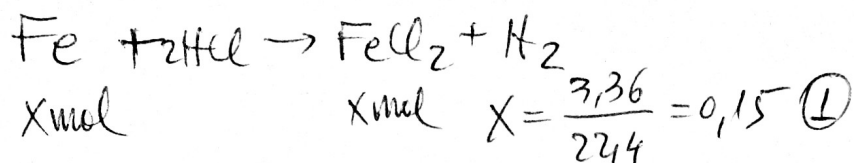
$$(1) \frac{10^{-5}}{10^{-5}} = \frac{C_{\text{b}}}{C_{\text{Cl}}} \rightarrow C_{\text{Cl}} = C_{\text{b}} \rightarrow \eta - 0,4 = \frac{0,4}{0,8}$$

$$\boxed{\eta = 0,8}$$

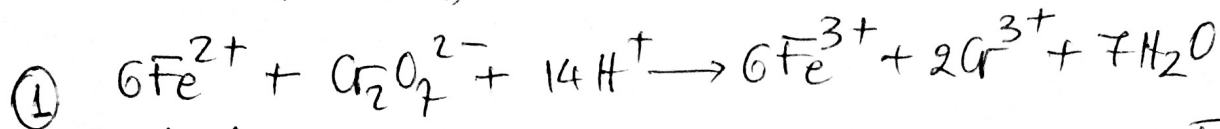
13

$x \text{ mol Fe}, y \text{ mol FeO}$

6



lượng $(x+y) \text{ mol FeCl}_2$ và $(x+y) \text{ mol Fe}^{2+}$
 $67 \times 400 \text{ mol}$
 $87 \times 200 \text{ mol}$
 $\frac{(x+y)}{2} \text{ mol Fe}^{2+}$



$$\frac{(x+y) \text{ mol}}{2} \quad \frac{x+y}{2 \cdot 6} = \frac{1 \cdot 0,1}{6} \Rightarrow \boxed{x+y=0,2} \Rightarrow 0,15+y=0,2 \Rightarrow \boxed{y=0,05}$$

onoi? $x \cdot A_{\text{Fe}} = 0,15 \cdot 56 = 8,4 \text{ g}$
 $y \cdot M_{\text{FeO}} = 0,05 \cdot 72 = 3,6 \text{ g} \quad (1)$

Er $\frac{12 \text{ g}}{100}$ vào

$8,4 \text{ g Fe} \quad (1)$
 $3,6 \text{ g FeO}$
 $\frac{8,4}{100} = 8,4\%$
 $\frac{3,6}{100} = 3,6\%$