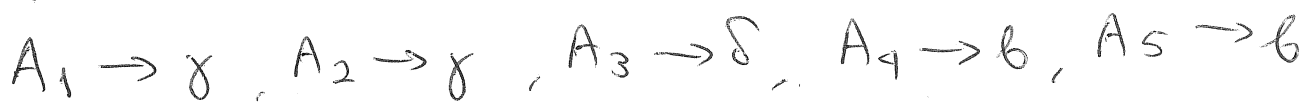


ΘΕΜΑ Α

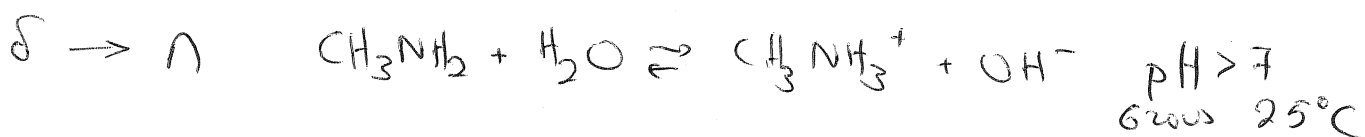
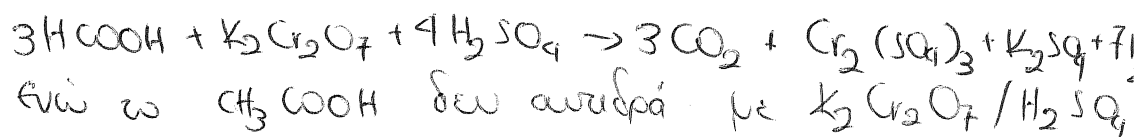


ΘΕΜΑ Β

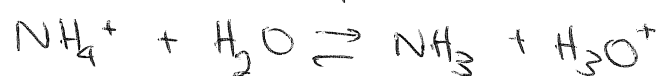
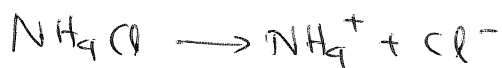
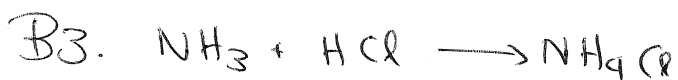
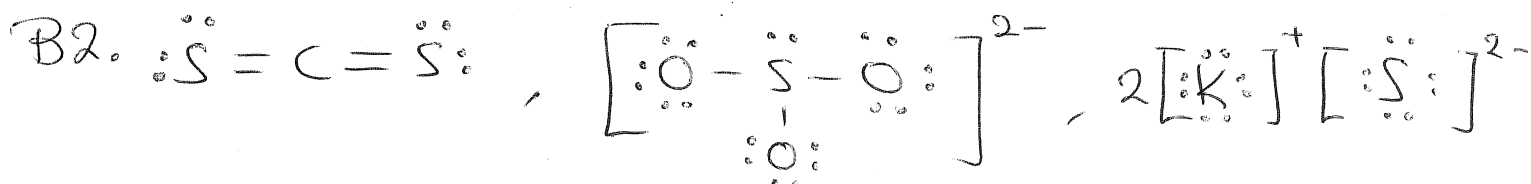


β → Σ Τα e^- του Cl είναι καταμεμυμένα σε περισσότερες συμβάδες, δηλαδή $n_{e_{Cl}} > n_{e_{HCl}}$

γ → Σ Το $HCOOH$ μεταφέρει το ποσοστό $K_2Cr_2O_7$ σε πράσινο.



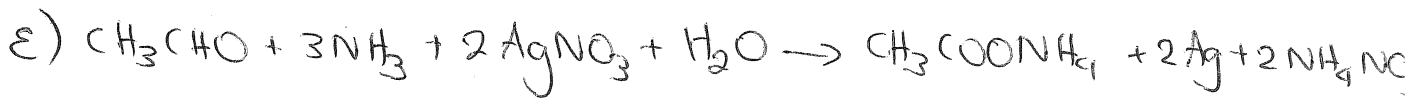
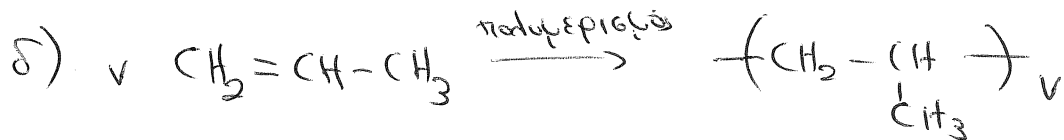
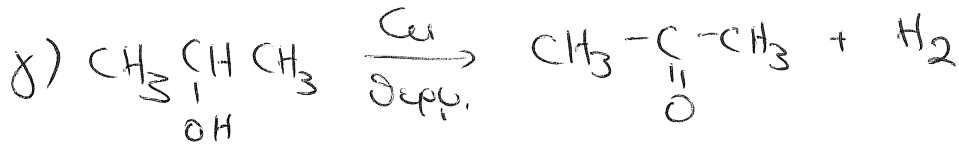
ε → Σ Σε διαφορετική θερμοκρασία αέρα $25^\circ C$



$pH < 7$

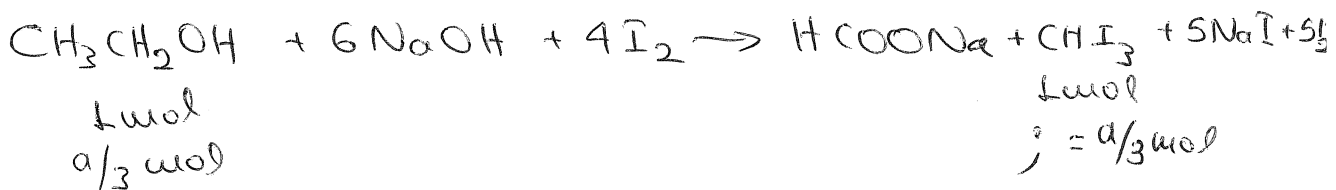
Πρέπει το pH του δ/τος να περιέχεται στην περιοχή αλλαγής χρώματος του δείκτη με βάση τις ποσότητες Cl^- και H_3O^+ (β)

ΘΕΜΑ Γ

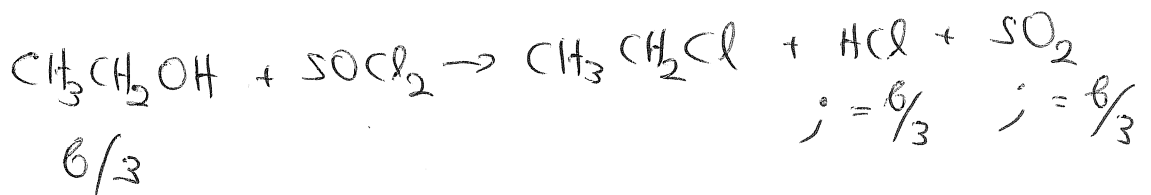
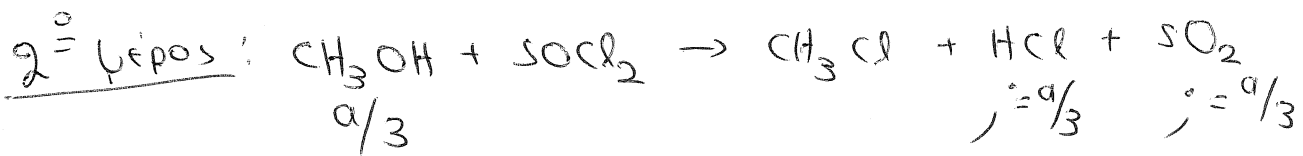


Γ2. Έστω α mol CH_3OH και β mol $\text{CH}_3\text{CH}_2\text{OH}$

1^ο βέρος: α/3 mol CH_3OH και β/3 mol $\text{CH}_3\text{CH}_2\text{OH}$
με I_2/NaOH αυξάνει μόνο η $\text{CH}_3\text{CH}_2\text{OH}$

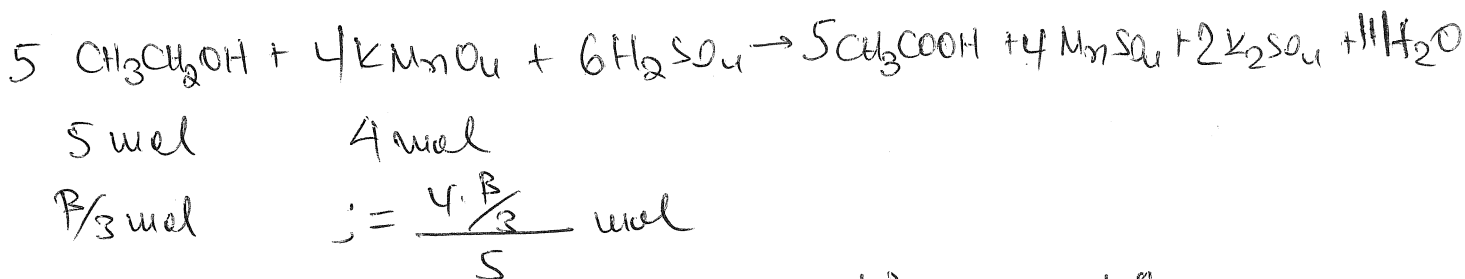
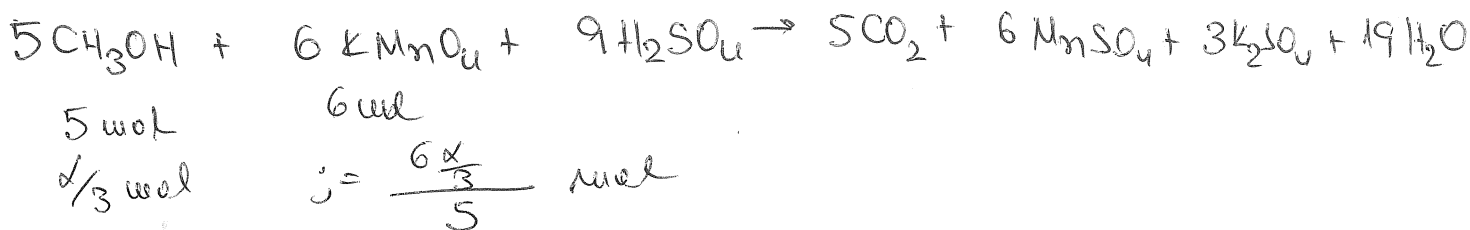


$\alpha/3 = 0,4 \Rightarrow \alpha = 1,2 \text{ mol} \text{ (1)}$



$2 \cdot \frac{\alpha}{3} + 2 \cdot \frac{\beta}{3} = \frac{44,8}{23,4} \Rightarrow \frac{2\alpha}{3} + \frac{2\beta}{3} = 2 \Rightarrow$

$\Rightarrow 2\alpha + 2\beta = 6 \Rightarrow 2(\alpha + \beta) = 6 \Rightarrow \alpha + \beta = 3 \quad \text{(2)} \Rightarrow \beta = 3 - 1,2 \Rightarrow \beta = 1,8 \text{ mol}$



$$M_{\text{KMnO}_4} = \frac{\frac{6 \cdot \frac{1}{3}}{5}}{\frac{1}{3}} + \frac{\frac{4 \cdot \frac{1}{3}}{5}}{\frac{1}{3}} = \frac{6 \cdot \frac{1}{3}}{5} + \frac{4 \cdot \frac{1}{3}}{5} =$$

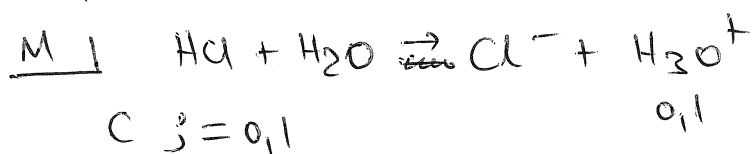
$$= 0,48 + 0,48 = 0,96 \text{ mol}$$

$$C = \frac{n}{V} \Rightarrow V_{\text{KMnO}_4} = \frac{n}{C} = \frac{0,96}{0,2} = 4,8 \text{ l.}$$

Θ ΕΜΑ Δ

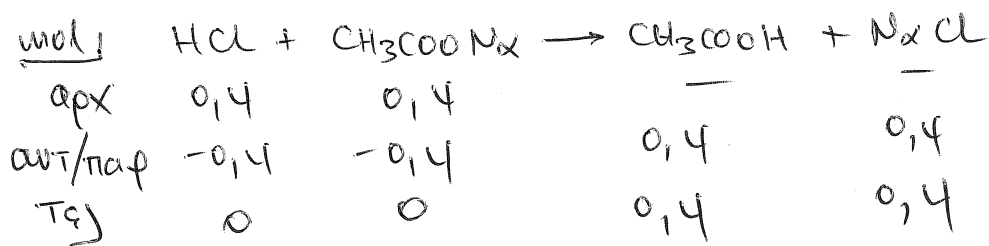
$$\Delta_1 \cdot C_{\text{apx}} \cdot V_{\text{apx}} = C_{\text{τρξ}} \cdot V_{\text{τρξ}} \quad (1)$$

$$\text{pH} = 1 \Rightarrow [\text{H}_3\text{O}^+] = 0,1 \text{ M.}$$



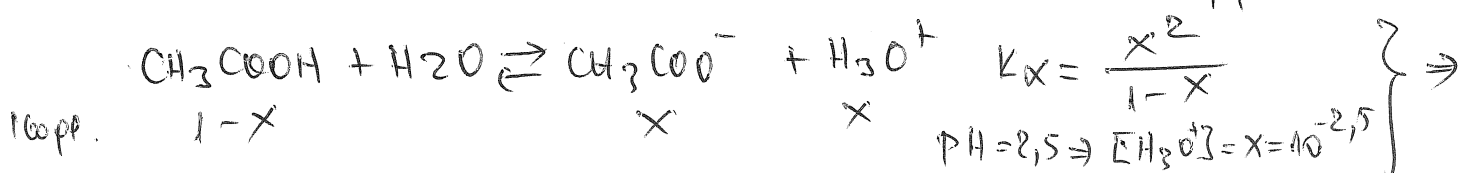
$$(1) \Rightarrow 1 \cdot 0,08 = 0,1 \cdot V_{\text{τρξ}} \Rightarrow V_{\text{τρξ}} = \frac{0,08}{0,1} = 0,8 \text{ l } \approx 800 \text{ mL}$$

$$\Delta_2 \cdot n_{\text{HCl}} = C \cdot v = 1 \cdot 0,4 = 0,4 \text{ mol}$$



$$C_{\text{CH}_3\text{COOH}} = C_{\text{NaCl}} =$$

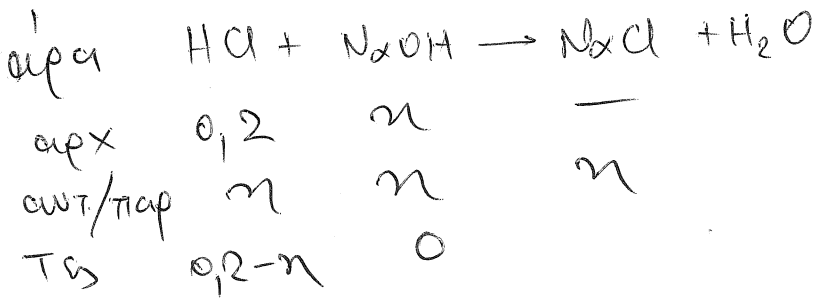
$$\frac{0,4}{0,4} = 1 \text{ M}$$



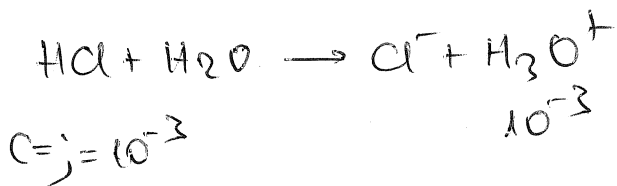
$$\Rightarrow \left. \begin{aligned} &K_x = \frac{10^{-5}}{1-x} \\ &\text{Εάν } \frac{K_x}{C} < 0,01 \\ &1-x \approx 1 \end{aligned} \right\} \Rightarrow K_x = 10^{-5}$$

Επίσης
 $K_x = \frac{10^{-5}}{1} = 10^{-5}$
 Βεβαιότητα είναι
 Πρόσδεξις

Δ_3 : $n_{HCl} = C \cdot V = 1 \cdot 0,2 = 0,2 \text{ mol}$



$$C_{HCl} = \frac{0,2-n}{0,2} \quad (2)$$



$$(2) \Rightarrow 10^{-3} = \frac{0,2-n}{0,2} \Rightarrow 2 \cdot 10^{-4} = 0,2-n \Rightarrow n = 0,2 - 2 \cdot 10^{-4}$$

$$\Rightarrow n = 0,1998 \text{ mol}$$

Εάν η τα mol N_{xOH}

• αν $n = 0,2$ τότε πλήρη εξουδ. και τελικό δ/μα N_xCl $pH = 7$ στους $25^\circ C$ απορρ.

• αν $n > 0,2$ τότε καταναλ. πλήρως το HCl και στο τελ. δ/μα $N_{xOH} - N_xCl$ $pH > 7$ απορρ.

$$pH = 3 \Rightarrow [H_3O^+] = 10^{-3}$$

Δ_4 . $n_{\text{HCl}} = 1 \cdot 0,1 = 0,1 \text{ mol}$

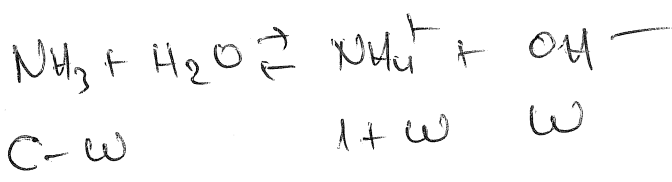
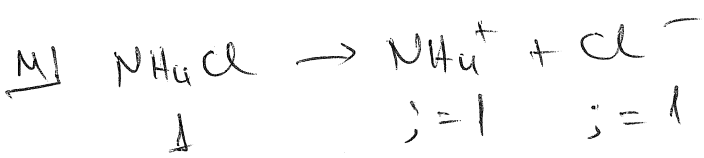


αρχ	0,1	n	—
αλ/π	-0,1	-0,1	0,1
ΤΣ	0	n-0,1	0,1

μην από διασύνταξη

$$C_{\text{NH}_3} = \frac{n-0,1}{0,1} \text{ M} \quad (3)$$

$$C_{\text{NH}_4\text{Cl}} = \frac{0,1}{0,1} = 1 \text{ M}$$



$$K_b = 10^{-5} = \frac{\omega(1+\omega)}{C-\omega}$$

$$\Rightarrow 10^{-5} = \frac{10^{-6}}{C} \Rightarrow C = 0,1 \text{ M}$$

$\text{pH} = 8$, $\text{pOH} = 6 \Rightarrow [\text{OH}^-] = \omega = 10^{-6}$

Από (3) $0,1 = \frac{n-0,1}{0,1} \Rightarrow 0,01 = n-0,1 \Rightarrow n = 0,11 \text{ mol}$