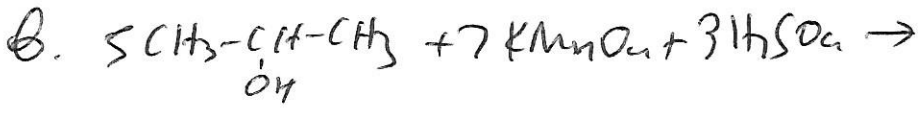


ΘΕΜΑ Α

①

A ₁	γ	A ₅	α	Σ	B ₁	γ	Δ	Β	Α	Ε	Σ
A ₂	δ										
A ₃	γ										
A ₄	α										

ΘΕΜΑ Β

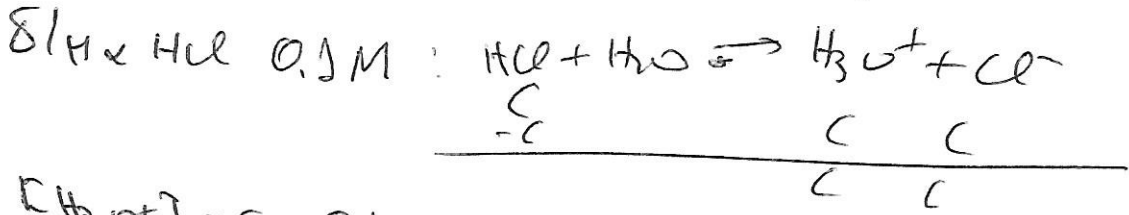


B₂ α. $\theta \uparrow \Rightarrow$ μετατόπιση ισορροπίας δεξιά \Rightarrow μείωση τ_{H^+} \Rightarrow μείωση τ_{H^+} και μείωση τ_{H^+} K_c

β. $\nu \uparrow \Rightarrow$ μετατόπιση ισορροπίας δεξιά \Rightarrow μείωση τ_{H^+} \Rightarrow μείωση τ_{H^+} και K_c σταθερό

B₃ $pK_a = 5$ περιοχή βράσης του διαλύτη 4-6

α) Δια. βίτα $pH < 4$ υδατικό
 $pH > 6$ υδατικό



$[H_3O^+] = C = 0,1M$ $pH = 1 < 4$ υδατικό

β) Η περιοχή είναι 4-6

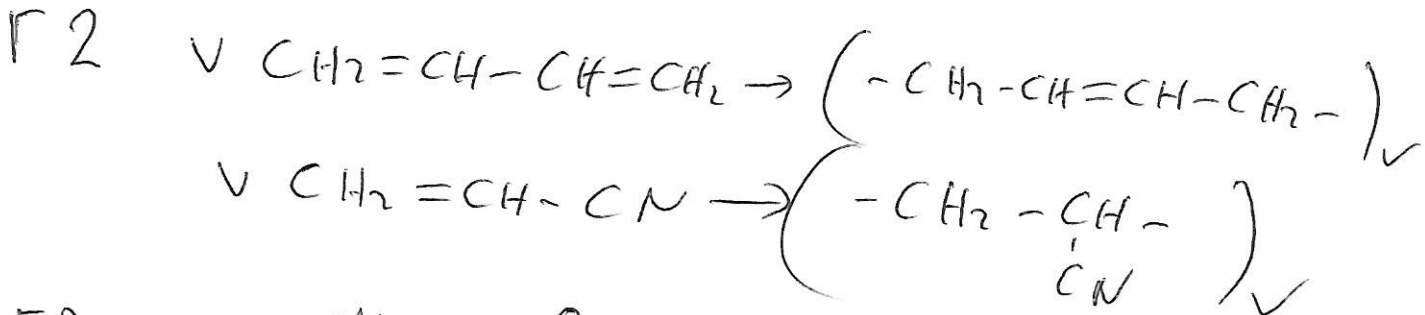
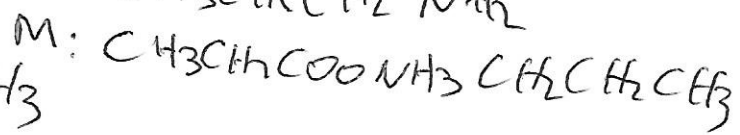
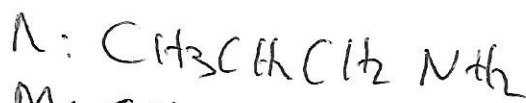
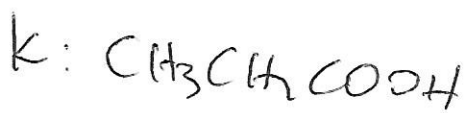
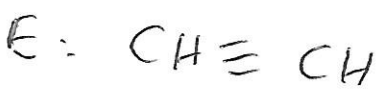
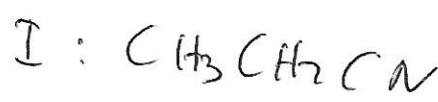
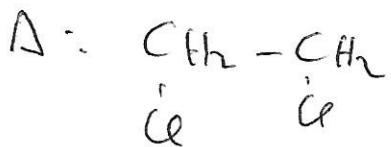
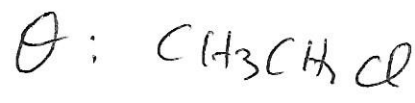
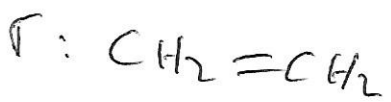
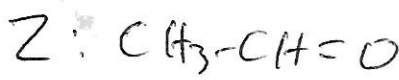
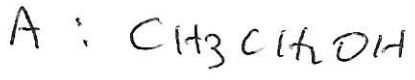
B₄ „Na $1s^2, 2s^2, 2p^6, 3s^1$ 3⁺ ηλεκ 1⁺ OM ζώνη S

17Cl $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$ 3⁺ ηλεκ 17⁺ OM ζώνη P

19K $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^1$ 4⁺ ηλεκ 1⁺ OM ζώνη S

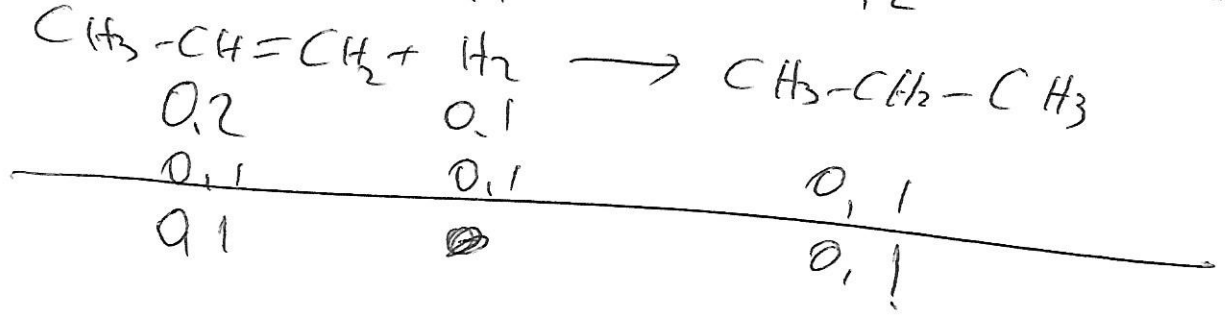
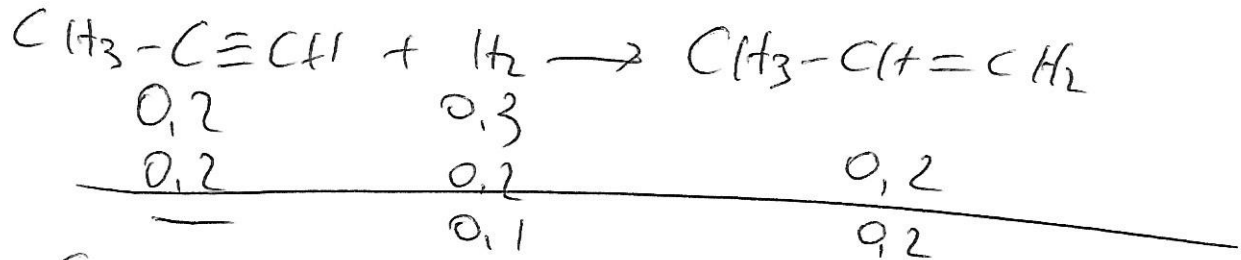
β. Το K είναι το μεγαλύτερο άτομο ενώ το Na είναι μικρότερο των Cl ενώ το Cl έχει μικρότερο Z: άρα $R_{Cl} < R_{Na} < R_K$

Θ εφια Γ:



Γ3 $n = \frac{m}{M_r} = \frac{8}{40} = 0,2 \text{ mol}$

$n_{\text{H}_2} = 0,3 \text{ mol}$

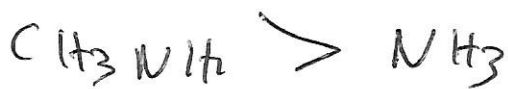


QEMA 40

(3)

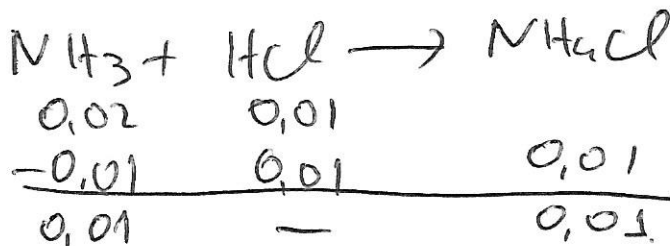
Δ_1 a) $a = \frac{10^3}{0,1} = 10^2$ b) $K_b = \frac{(10^3)^2}{0,1} = 10^{-5}$

$K_b \text{CH}_3\text{NH}_2 = (0,02)^2 \cdot 1 = 4 \cdot 10^{-4} > 10^{-5}$



Δ_2 $\left(\begin{matrix} 200\text{mL } \chi_1 \\ \text{NH}_3 \text{ } 0,1 \text{ M} \end{matrix} \right) + \left(\begin{matrix} 200\text{mL} \\ \text{HCl } 0,05 \text{ M} \end{matrix} \right) + (\text{H}_2\text{O}) = \left(\begin{matrix} 1 \text{ L} \\ \text{NH}_3 \text{ } 0,07 \text{ M} \\ \text{HCl } 0,04 \text{ M} \end{matrix} \right)$

$\text{pH} = 11$



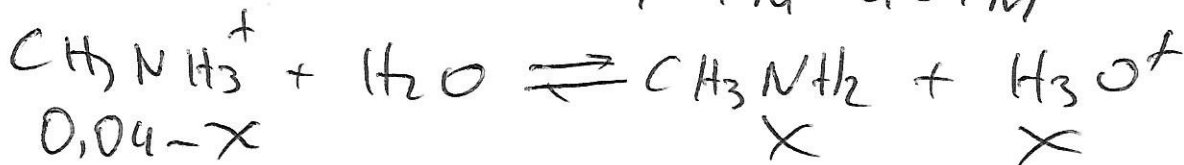
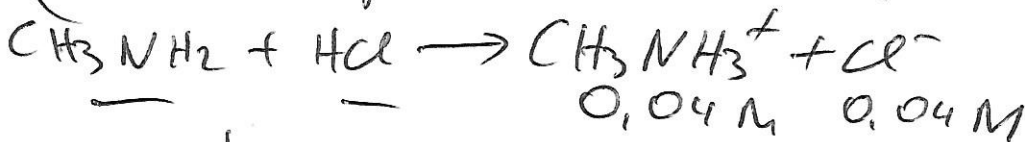
Pud. $\Delta(\text{H}^+)$

$[\text{H}_3\text{O}^+] = K_a \frac{C_3}{C_3 - C_4} \Rightarrow$

$[\text{H}_3\text{O}^+] = \frac{10^{-14} \cdot 0,01}{10^{-5} \cdot 0,01} = 10^{-9}$

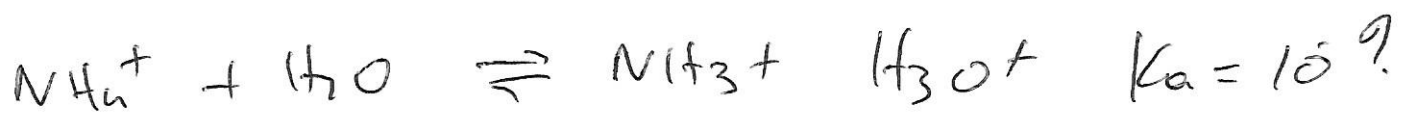
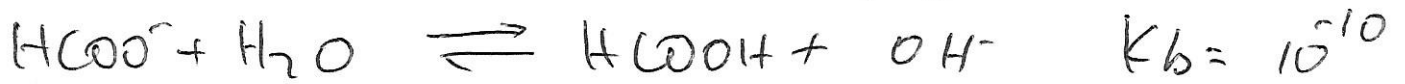
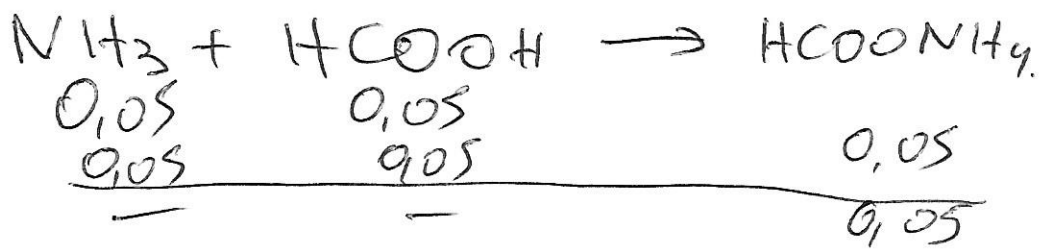
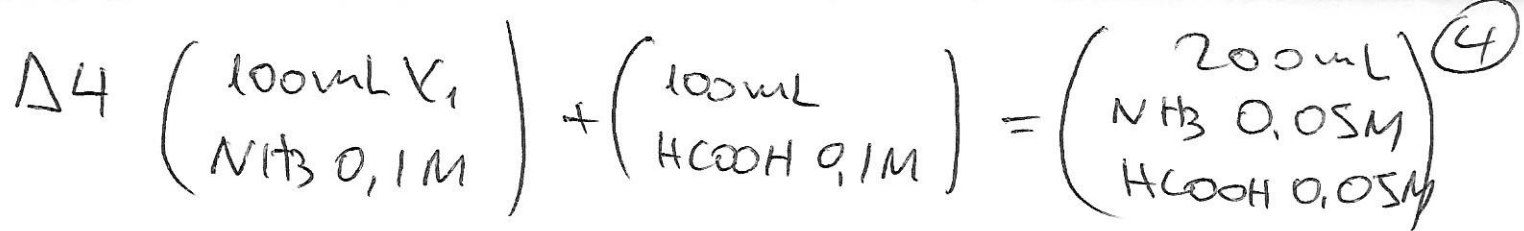
$\text{pH} = 9$

Δ_3 $\left(\begin{matrix} 10\text{mL } \chi_2 \\ \text{CH}_3\text{NH}_2 \text{ } 1 \text{ M} \end{matrix} \right) + \left(\begin{matrix} 200\text{mL} \\ \text{HCl } 0,05 \text{ M} \end{matrix} \right) = \left(\begin{matrix} 210\text{mL} \\ \text{CH}_3\text{NH}_2 \text{ } 0,04 \text{ M} \\ \text{HCl } 0,04 \text{ M} \end{matrix} \right)$



$K_a = \frac{[\text{CH}_3\text{NH}_2][\text{H}_3\text{O}^+]}{[\text{CH}_3\text{NH}_3^+]} \Rightarrow \frac{10^{-14}}{4 \cdot 10^{-4}} = \frac{x^2}{4 \cdot 10^{-2}} \Rightarrow x = 10^{-6} \text{ M}$

$\text{pH} = 6$



$K_a > K_b$ α > β > γ