



ΧΗΜΕΙΑ ΘΕΤΙΚΗΣ ΚΑΤΕΥΘΥΝΣΗΣ
ΑΠΑΝΤΗΣΕΙΣ ΣΤΑ ΘΕΜΑΤΑ ΕΞΕΤΑΣΕΩΝ 2009

ΘΕΜΑ 1^ο

1.1. γ

1.2. γ

1.3. β

1.4. δ

1.5. α. ΛΑΘΟΣ

β. ΣΩΣΤΟ

γ. ΣΩΣΤΟ

δ. ΛΑΘΟΣ

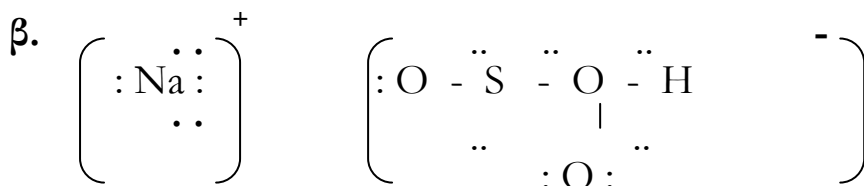
ε. ΣΩΣΤΟ

ΘΕΜΑ 2^ο

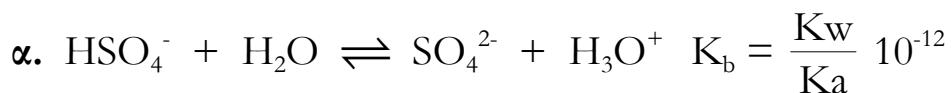
2.1 α. ${}_8\text{O} \quad 1s^2 \ 2s^2 \ 2p^4 \quad \text{K:2} \ \text{L:6}$

${}_{11}\text{Na} \quad 1s^2 \ 2s^2 \ 2p^6 \ 3s^1 \quad \text{K:2} \ \text{L:8} \ \text{M:1}$

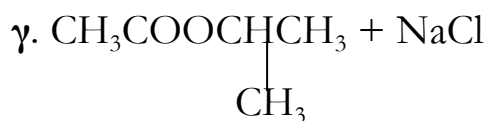
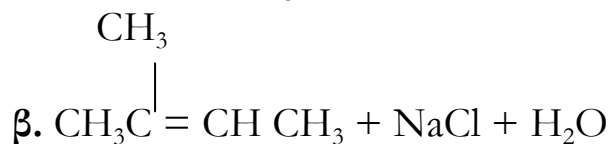
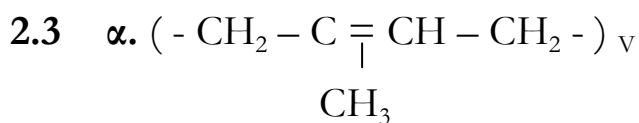
${}_{16}\text{S} \quad 1s^2 \ 2s^2 \ 2p^6 \ 3s^2 \ 3p^4 \quad \text{K:2} \ \text{L:8} \ \text{M:6}$



2.2

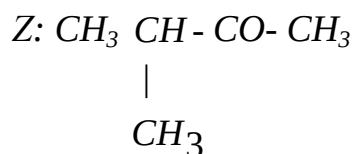
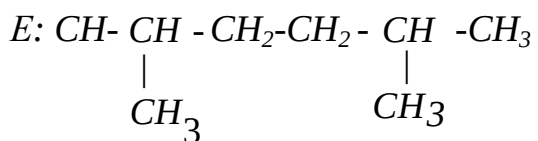
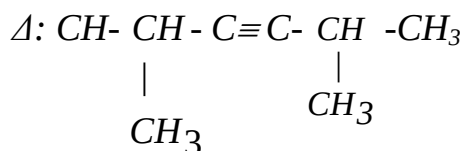
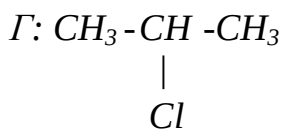
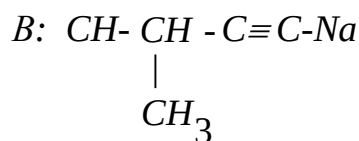
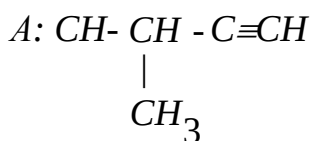


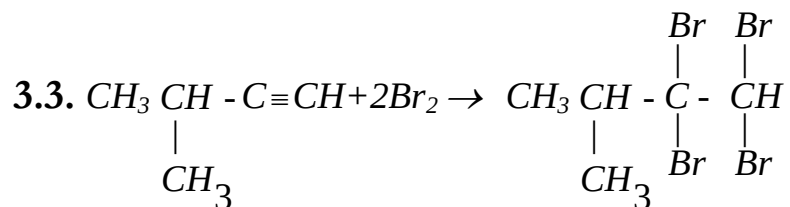
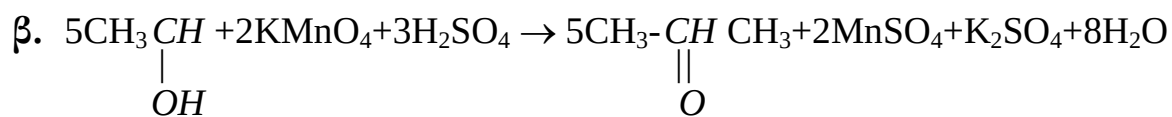
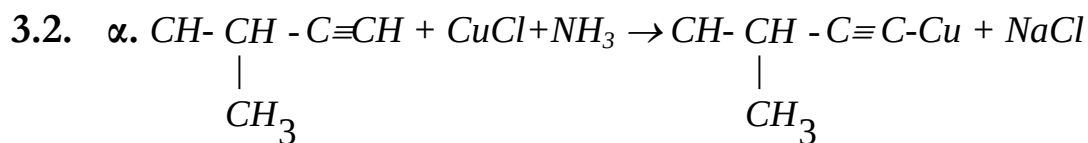
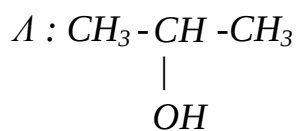
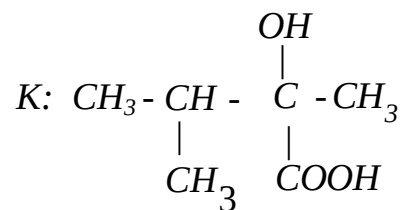
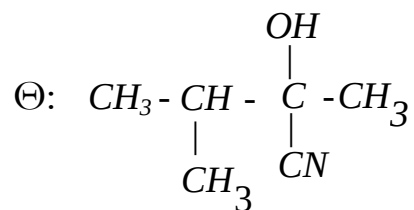
β. Η ΙΣΟΡΡΟΠΙΑ ΕΙΝΑΙ ΜΕΤΑΤΟΠΙΣΜΕΝΗ ΠΡΟΣ ΤΑ ΑΡΙΣΤΕΡΑ ΓΙΑΤΙ ΠΗΓΑΙΝΕΙ ΠΡΟΣ ΤΗΝ ΚΑΤΕΥΘΥΝΣΗ ΠΟΥ ΕΙΝΑΙ ΤΑ ΑΣΘΕΝΕΣΤΕΡΑ ΟΞΕΑ ΚΑΙ ΒΑΣΕΙΣ.



ΘΕΜΑ 3^ο

3.1.





$$\delta/\mu\alpha \quad \text{Br}_2: \quad \text{C} = \frac{n}{v} \Rightarrow v = \frac{n}{c} = \frac{0.2}{0.4} = 0.5\text{L}$$

ΘΕΜΑ 4°

α)

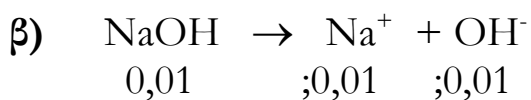
M	$\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$		
Αρχ.	0,1		
A/π	0,1a	0,1α	0,1α
Ισορ.	0,1(1-α)	0,1α	0,1α

$$K_b = 0.1a^2 \Leftrightarrow a^2 = 10^{-4} \Leftrightarrow a = 10^{-2} \Leftrightarrow \text{pOH} = 2 \quad \text{pH} = 12$$

mol	$\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$		
Αρχ.	0,01		
A/π	0,01a	0,01a	0,01a
Ισορ.	0,01(1-α)	0,01a	0,01a
Συγκ.	$\frac{0.01}{y}$	$\frac{0.01a}{y}$	$\frac{0.01a}{y} = 10^{-4}$

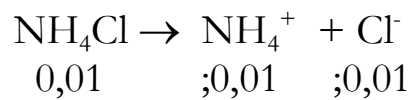
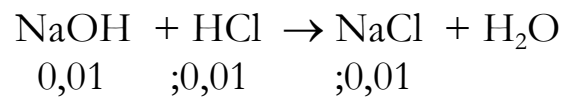
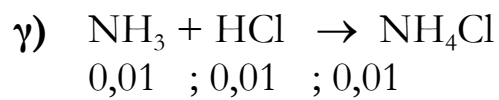
$$K_b = \frac{10^{-8}}{10^{-2}} \Leftrightarrow 10^{-5} = 10^{-6} y \Leftrightarrow y = 10 \text{ L}$$

$$x = 10 - 0.1 = 9.9 \text{ L}$$



(M)	$\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$		
Αρχ.	0,01 0.01		
A/π	0,01a	0,01α	0,01α
Ισορ.	0,01(1-α)	0,01α	0,01(1+α)

$$K_b = 0.01a \Leftrightarrow a = 10^{-3} \Leftrightarrow \text{pOH} = 3 \Leftrightarrow \text{pH} = 11$$



(M)	$\text{NH}_4^+ + \text{H}_2\text{O} \rightleftharpoons \text{NH}_3 + \text{H}_3^+\text{O}$
Αρχ.	0,01
A/π	0,01α 0,01α 0,01α
Ισορ.	0,01(1-α) 0,01α 0,01α

$$\frac{K_w}{K_b} = 0,01\alpha^2 \Leftrightarrow \alpha = 10^{-3,5} \quad \text{Αρχ pH} = 5,5$$

Επιμέλεια : Καθηγητών Φροντιστηρίων Βακάλη