

ΕΠΑΝΑΛΗΠΤΙΚΑ ΘΕΜΑΤΑ Ο.Ε.Φ.Ε. 2003

ΘΕΜΑΤΑ ΧΗΜΕΙΑΣ Γ' ΛΥΚΕΙΟΥ
ΘΕΤΙΚΗΣ ΚΑΤΕΥΘΥΝΣΗΣ
ΑΠΑΝΤΗΣΕΙΣ

Θέμα 1^ο

A.

1. δ 2. β 3. δ

B.

$$\text{Ar} \alpha \ 1s^2 2s^2 2p^3 \quad (:X)$$

1. VA ομάδα $Z = 7$

2. Η εξωτερική στιβάδα ... $2s^2 2p^3$ συνεπώς όλες οι δυνατές τετράδες (n, ℓ, m_ℓ, m_s)

3. $\text{Mg} < \text{Be} < \text{X}$

4. $3\text{Mg}^{+2} + 2\text{X}^{-3} \rightarrow 3\text{Mg}^{+2}, 2\text{X}^{-3}$

Г.

1. γ 2. δ 3. α

Θέμα 2^ο

A.

1. α) ο ηλεκτρολύτης είναι το HCOOK

$$\beta) \text{HCOOK} \rightarrow \text{HCOO}^- + \text{K}^+$$
$$\text{HCOO}^- + \text{H}_2\text{O} \rightleftharpoons \text{HCOOH} + \text{OH}^-$$
$$2\text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{OH}^-, \text{HCOOH} + \text{H}_2\text{O} \rightleftharpoons \text{HCOO}^- + \text{H}_3\text{O}^+$$

2. το α

B.

1. στο α

H

H

$$2. \quad \text{H}-\text{C}_{(1)}-\text{C}_{(2)} \equiv \text{C}_{(3)}-\text{C}_{(4)} = 0 \begin{matrix} 8\sigma \\ 3\pi \end{matrix}$$

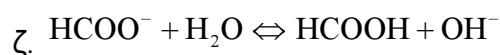
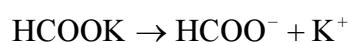
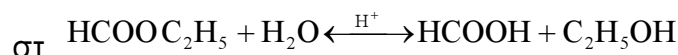
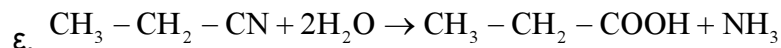
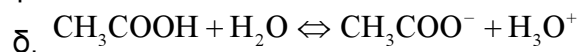
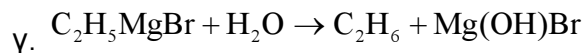
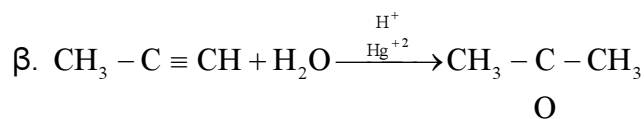
H

$$C_{(1)} \rightarrow sp^3 \quad C_{(2)} \text{ και } C_{(3)} \rightarrow sp \quad C_{(4)} \rightarrow sp^2$$

3.

OH

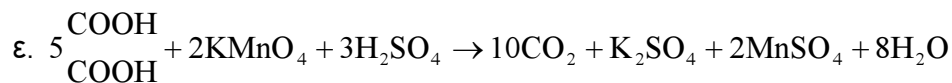
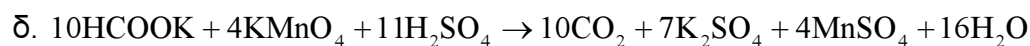
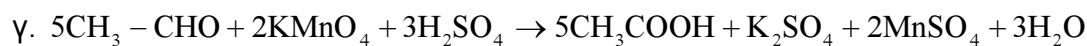
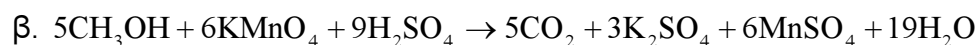
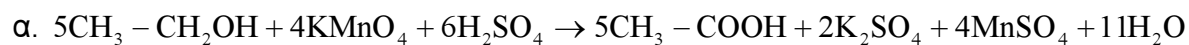
$$\alpha. \text{CH}_3 - \text{CH} = \text{CH}_2 + \text{H}_2\text{O} \xrightarrow{\text{H}^+} \text{CH}_3 - \text{CH} - \text{CH}_2 (\kappa.\pi.)$$
$$\xrightarrow{\text{H}^+} \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH} \text{ (δευτερεύων)}$$



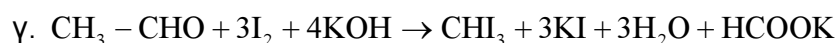
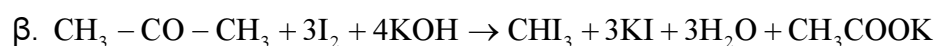
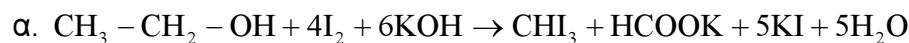
Θέμα 3^ο

A.

1.

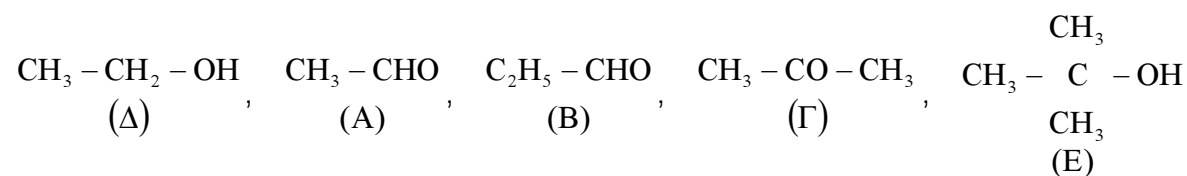


2.

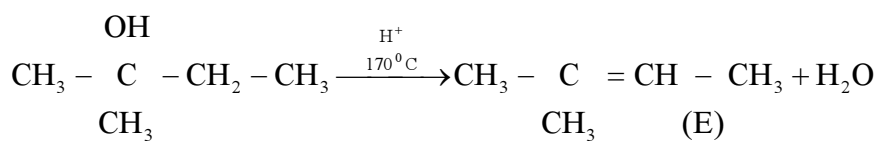
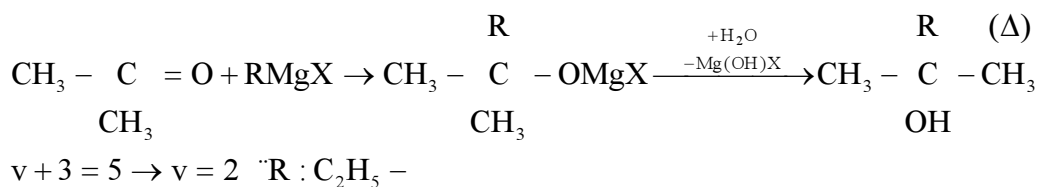
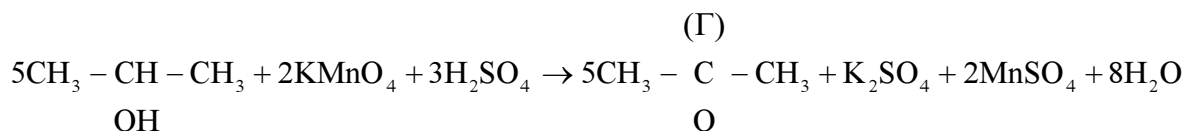
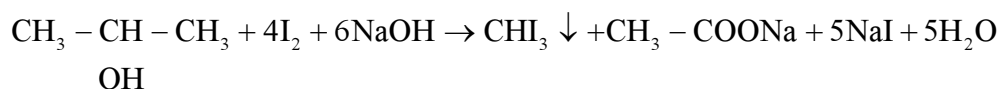
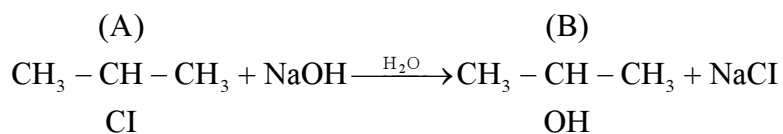


B.

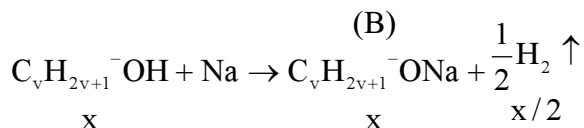
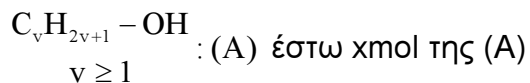
	A	B	Γ	Δ	E
I ₂ / NaOH	+	-	+	+	-
KMnO ₄ / H ⁺	+	+	-	+	-
Na	-	-	-	+	+
Tollens	+	+	-	-	-



Γ.



Θέμα 4^ο

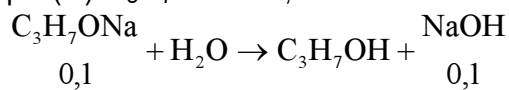


$$\frac{x}{2} \cdot 22,4 = 1,12 \rightarrow x = 0,1 \text{ mol}$$

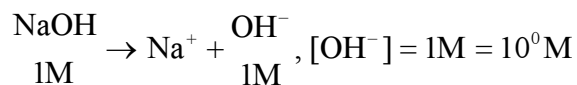
$$\alpha. \text{Mr(A)} = \frac{6}{0,1} = 60 : 60 = 14v + 18 \rightarrow 14v = 42 \rightarrow v = 3$$

$$\text{M.T. C}_3\text{H}_7\text{OH} \text{ προπανόλη } m_{\text{Na}} = 0,1 \cdot 23 = 2,3 \text{ g}$$

$$\beta. \text{(B) C}_3\text{H}_7\text{ONa} \quad 0,1 \text{ mol}$$



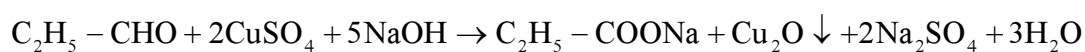
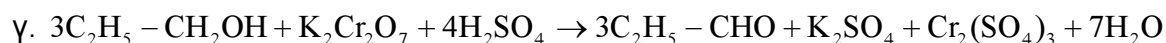
$$\text{NaOH } 0,1\text{mol ή } C = \frac{0,1}{0,1} = 1\text{M}$$



$$\text{pOH} = -\log[\text{OH}^-] = 0, \text{pH} + \text{pOH} = 14 \rightarrow \text{pH} = 14$$

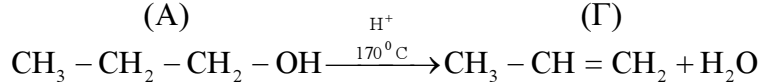
(A)

(B)

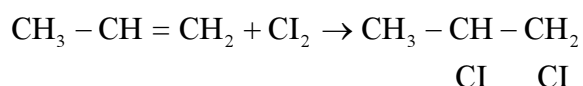


(A)

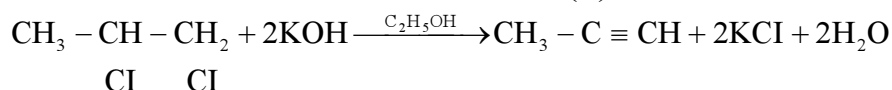
(Γ)



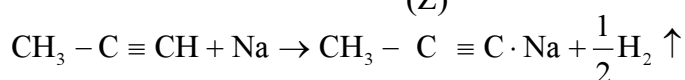
(Δ)



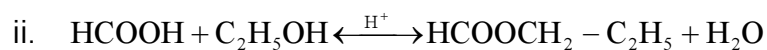
(E)



(Z)



δ.



αρχ.	0,1	0,1	-	-
αντ	ω	ω	-	-
παρ	-	-	ω	ω
Χ.Ι.	0,1 - ω	0,1 - ω	ω	ω

$$K_{c_1} = 4 = \frac{[\text{HCOOC}_3\text{H}_7] \cdot [\text{H}_2\text{O}]}{[\text{HCOOH}][\text{C}_3\text{H}_7\text{OH}]} = \frac{\frac{\omega}{\nu} \cdot \frac{\omega}{\nu}}{\frac{0,1-\omega}{\nu} \cdot \frac{0,1-\omega}{\nu}} = \left(\frac{\omega}{0,1-\omega} \right)^2 \rightarrow$$

$$\rightarrow 2^2 = \left(\frac{\omega}{0,1-\omega} \right)^2 \rightarrow 2 = \frac{\omega}{0,1-\omega} \rightarrow \omega = 0,06 (\text{προσέγγιση})$$

$$\alpha = \frac{0,06}{0,1} = 0,6 \text{ ή } 60\%$$