Correction Série 1 BIS

Exercice 1 :

1. $44g\ CO_2 \longrightarrow 12g\ C$

$2,761g\ CO_2 \longrightarrow m(C) = 0,753g$

$\%(C) = \frac{0,735}{0,825} \times 100 = 91,3\%$

$18g\ H_2O \longrightarrow 2g\ H$

$0,1648g\ H_2O \longrightarrow m(H) = 0,072g$

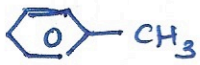
$\%(H) = \frac{0,072}{0,825} \times 100 = 8,7\%$

$\%(C) + \%(H) = 100$. Donc la substance ne contient que du carbone et de l'hydrogène

2. $x = \frac{M \times \%(C)}{1200} = \frac{92 \times 91,3}{1200} = 7$

$y = \frac{M \times \%(H)}{100} = \frac{92 \times 8,7}{100} = 8$

F.B : C_7H_8

3. 

Exercice 2 :

1. $PV = nRT \Rightarrow PV = \frac{m}{M} \cdot RT$

$\Rightarrow M = \frac{mRT}{PV}$

$M = \frac{20 \times 8,314 \times 308}{10^5 \times 6,92.10^{-3}} = 74\ g.mol^{-1}$

2. $x = \frac{M \times \%(C)}{1200} = \frac{74 \times 64,9}{1200} = 4$

$y = \frac{M \times \%(H)}{100} = \frac{74 \times 13,5}{100} = 10$

3. $\%(O) = 100 - (64,9 + 13,5) = 21,6\%$

$z = \frac{M \times \%(O)}{1600} = 1$

Donc F.B : $C_4H_{10}O$

$CH_3-CH_2-CH_2-CH_2-OH$; $CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-CH_2-OH$

$CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-OH$; ~~CH_3-CH~~ $CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{OH}{|}}{C}}-CH_3$

Exercice 3 :

Partie A : $M = 29d = 29 \times 10,62 = 308$

$M = 308\ g/mol$

$x = \frac{M \times \%(C)}{1200} = \frac{308 \times 74,02}{1200} = 19$

$y = \frac{M \times \%(H)}{100} = \frac{308 \times 6,49}{100} = 20$

$z = \frac{M \times \%(O)}{1600} = \frac{308 \times 10,39}{1600} = 2$

$t = \frac{M \times \%(N)}{1400} = \frac{308 \times 9,10}{1400} = 2$

Partie B :

1. $C_nH_{2n+2} + \left(\frac{3n+1}{2}\right)O_2 \rightarrow n\,CO_2 + (n+1)\,H_2O$

2. $V_f(CO_2) = V(O_2)_{rest} = \frac{80}{2} = 40\ cm^3$

Ainsi $V(O_2)_{réagi} = 40\ cm^3$

3. D'après l'équat° :

$V = \frac{V(CO_2)}{n} \Rightarrow n = \frac{V(CO_2)}{V}$

$n = \frac{40}{10} = 4 \Rightarrow$ F.B : C_4H_{10}

4. $CH_3-CH_2-CH_2-CH_3$

$CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_3$

Exercice 4 :

1. $\%(C) = \frac{m(C)}{m} \times 100$

$= \frac{70,5}{500} \times 100 = 14,1\%$

$\Rightarrow M = \frac{1200}{\%(C)} = \frac{1200}{14,1} = 85\ g/mol$

$\Rightarrow 12 + x + 35{,}5y = 85$

$\Rightarrow x + 35{,}5y = 73$

si $x = 2 \Rightarrow y = \frac{73-2}{35{,}5} = 2$

Donc F.B: CH_2Cl_2

2. $H-\underset{\underset{Cl}{|}}{\overset{\overset{Cl}{|}}{C}}-H$

Exercice 5:

$m(C) = \frac{12 \times m(CO_2)}{44} = 0{,}36\,g$

$\%(C) = \frac{0{,}36}{0{,}15g} \times 100 = 61\%$

$m(H) = \frac{2 \times m(H_2O)}{18} = 10{,}17\%$

$\%(H) = \frac{0{,}06 \times 100}{0{,}15g} = 10{,}17\%$

$m(N) = \frac{14 \times m(NH_3)}{17} = 0{,}14\,g$

$\%(N) = \frac{0{,}14 \times 100}{0{,}15g} = 23{,}73\%$

2. $M = 29\,d = 61{,}19\,g/mol$

On trouve après calcul

$x = 3$; $y = 6$ et $z = 1$

$\Rightarrow$ F.B: C_3H_6N

3. FS.D:

$CH_3-\underset{\underset{NH_2}{|}}{CH}-CH_3$

$CH_3-CH_2-CH_2-NH_2$

Exercice 6:

$n = \frac{m}{M} \Rightarrow M = \frac{m}{n}$ or $PV = nRT$

$\Rightarrow M = \frac{mRT}{PV}$ or $V = \frac{m}{\rho}$ $\quad n = \frac{PV}{RT}$

$\Rightarrow M = \frac{RT\rho}{P} = 72\,g/mol$

Après calcul on trouve: $x = 4$; $y = 8$

et $z = 1 \Rightarrow$ F.B: C_4H_8O

2. F.S.D:

$CH_3-CH_2-CH_2-\underset{\underset{H}{\backslash}}{\overset{\overset{O}{\|}}{C}}$

$CH_3-\underset{\underset{H}{\backslash}}{\overset{\overset{O}{\|}}{\underset{\underset{CH_3}{|}}{CH}-C}}$

$CH_3-\underset{\underset{O}{\|}}{C}-CH_2-CH_3$

$CH_3-\underset{\underset{OH}{|}}{CH}-CH=CH_2$

Exercice 7:

1. $m(N) = n \times M = 0{,}1 \times 28 = 2{,}8\,g$

$\%(N) = \frac{2{,}8 \times 100}{6} = 46{,}7\%$

2. $M = 29\,d = 60\,g/mol$

$\frac{M}{100} = \frac{16}{\%(O)} \Rightarrow \%(O) = \frac{1600}{M}$

$\%(O) = \frac{1600}{60} = 26{,}67\%$

3. Mq $\%(C) = 3\%(H)$

$m(C) = \frac{12 \cdot m(CO_2)}{44} = \frac{3}{11} m(CO_2)$

$m(H) = \frac{2 \cdot m(H_2O)}{18} = \frac{1}{9} m(H_2O)$

$\frac{m(C)}{m(H)} = \frac{\frac{3}{11} \cdot m(CO_2)}{\frac{1}{9} m(H_2O)}$

$= \frac{3 \times 9}{11} \cdot \frac{m(CO_2)}{m(H_2O)}$

$= \frac{3 \times 9}{11} \times \frac{11}{9}$

$\frac{m(C)}{m(H)} = 3 \Rightarrow m(C) = 3\,m(H)$

Donc $\%(C) = 3\%(H)$

$\%(N) + \%(O) + \%(H) + \%(C) = 100$

$\Rightarrow \%(H) + \%(C) = 26{,}63$

$\Rightarrow \%(H) + 2\%(H) = 26,63$

$\Rightarrow \%(H) = \frac{26,63}{3} = 6,7\%$

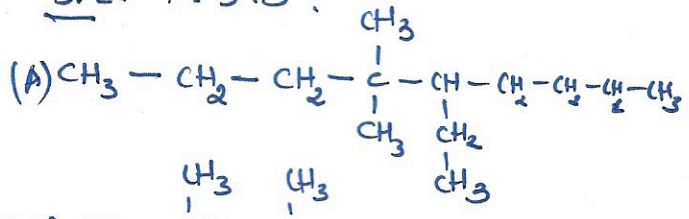
$\%(C) = 3 \times \%(H) = 20\%$

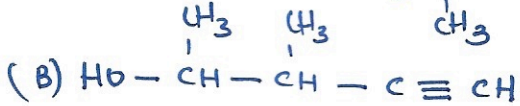
H. Après calcul on trouve :

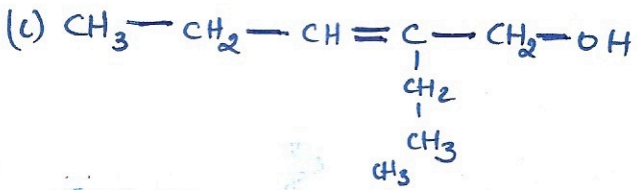
$x = 1$; $y = 4$; $z = 1$ et $t = 2$

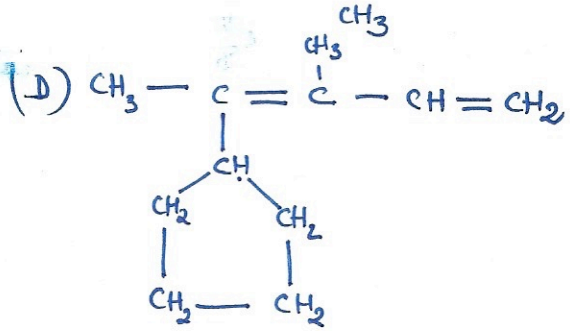
F.B : CH_4ON_2

5.1. F.s.D :

(A) 

(B) 

(C) 

(D) 

5.2. A : $C_{13}H_{28}$; B : $C_6H_{10}O$

C : $C_7H_{14}O$; D : $C_{11}H_{18}$

Il y a pas d'isomère

Exercice 8 :

1.1. $C_xH_yO + \left(x + \frac{y}{4} - \frac{1}{2}\right)O_2 \rightarrow x\,CO_2 + \frac{y}{2}H_2O$

1.2. $M = 29d = 88,16\ g/mol$.

$n(A) = \frac{3,52}{88,16} = 0,04\ mol$

$n(CO_2) = \frac{V}{V_m} = \frac{5}{25} = 0,2\ mol$.

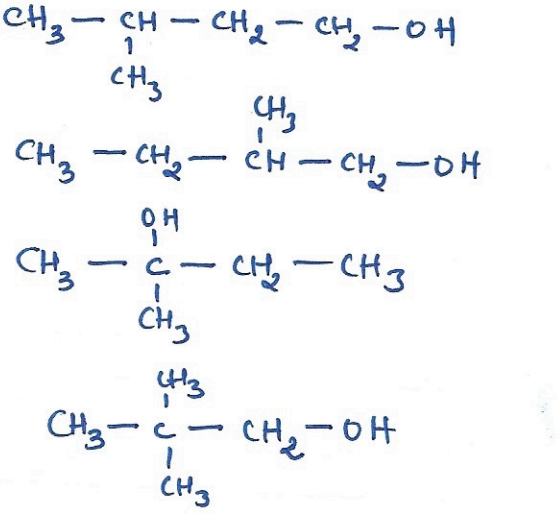
$\frac{n(A)}{1} = \frac{n(CO_2)}{x} \Rightarrow x = \frac{n(CO_2)}{n_A}$

$\Rightarrow x = \frac{0,2}{0,04} = 5$.

$M = 12x + y + 16 = 88$

$\Rightarrow y = 88 - (12 \times 5 + 16) = 12$

F.B : $C_5H_{12}O$

1.3. 

2.1. $C_xH_yO_z$

$z = 1 \Rightarrow C_xH_yO$

$m_C = 6\,m_H \Rightarrow 12x = 6y$

$m_C = 2,25\,m_O \Rightarrow 12x = 2,25 \times 16$

$x = \frac{2,25 \times 16}{12} = 3$

$12x = 6y \Rightarrow y = \frac{12x}{6} = 6$

F.B : C_3H_6O

2.2. $M = 3 \times 12 + 6 \times 1 + 16 \times 1$

$M = 58\ g/mol$

2.3. $n = \frac{m}{M}$ or $m = \rho \cdot V$

$n = \frac{\rho \cdot V}{M} = \frac{800 \times 1}{58}$

$\boxed{n = 13,8\ mol}$