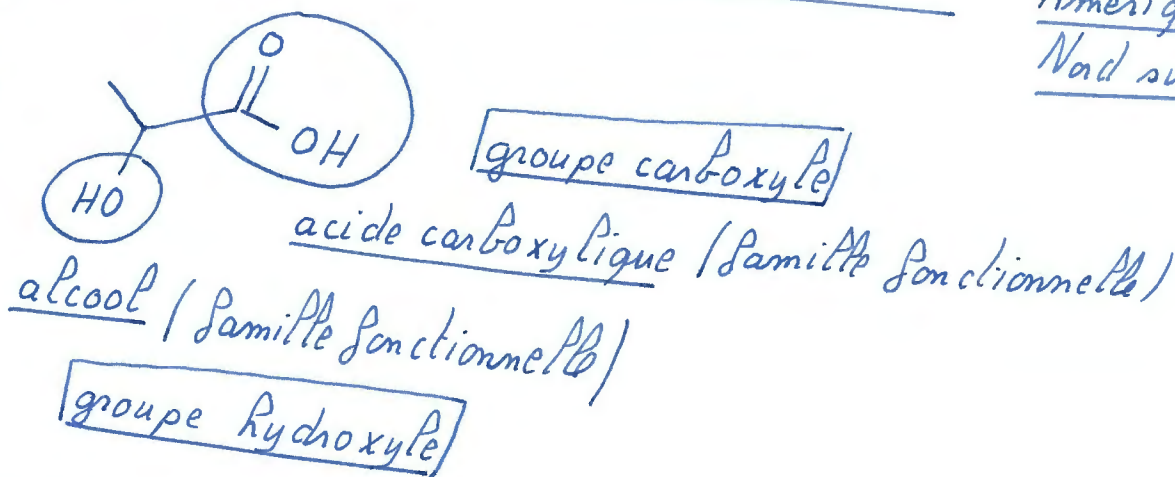


Exercice L'acide lactique et le lactate d'éthyle

2021

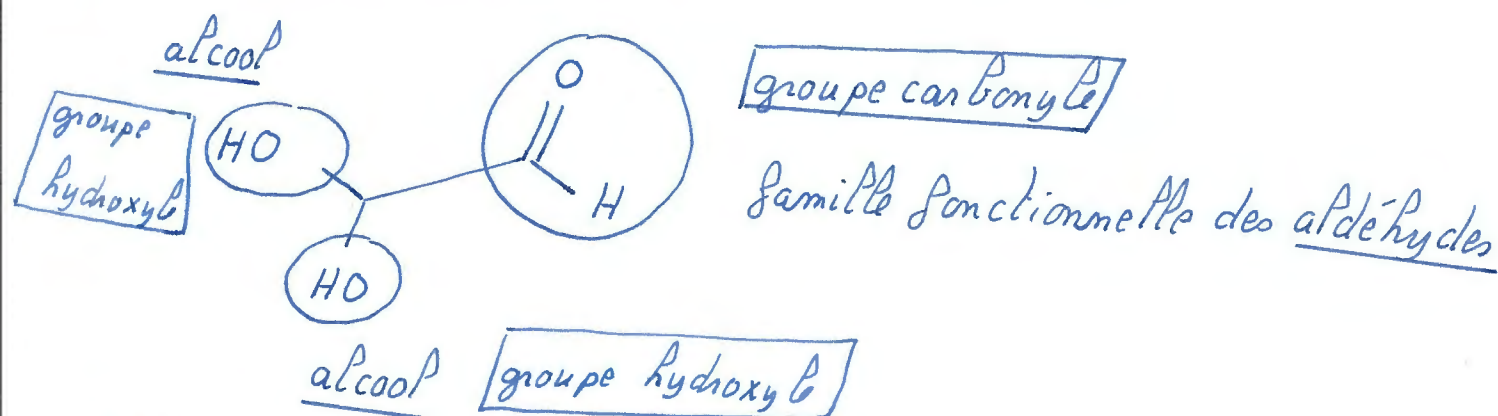
Amérique du Nord sujet 1

A.1

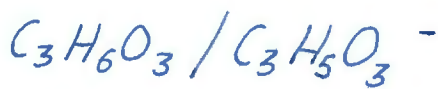


A.2

isomère de position



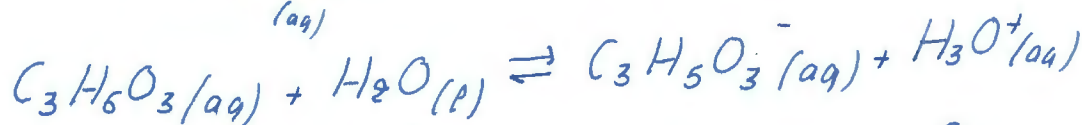
A.3



couples acide/base

A.4

$$K_A = \frac{[C_3H_5O_3^-]_{(aq)} \times [H_3O^+]_{(aq)}}{[C_3H_6O_3]_{(aq)} \times C_0}$$



état initial

$C \times V$

solvant

0

0

état final

$C \times V - x_f$

solvant

x_f

x_f

$$[H_3O^+] = \frac{x_f}{V}$$

$$[C_3H_5O_3^-]_{(aq)} = \frac{x_f}{V} = [H_3O^+]_{(aq)}$$

$$[C_3H_6O_3(aq)] = \frac{C \times V - x_f}{V} = C - \frac{x_f}{V} = C - [H_3O^+]_{(aq)}$$

$$\text{donc } K_A = \frac{[H_3O^+_{(aq)}]^2}{(C - [H_3O^+_{(aq)}]) \times C_0}$$

$$\text{A.5 } [H_3O^+_{(aq)}] = C_0 \times 10^{-pH}$$

$$[H_3O^+_{(aq)}] = 10 \times 10^{-3,03} = 9,33 \times 10^{-4} \text{ mol } P.L^{-1}$$

$$\text{A.6 } [H_3O^+] \neq C \text{ donc l'acide n'est pas un acide fort}$$

$$\alpha = \frac{\alpha_f}{\alpha_{max}} = \frac{10^{-pH}}{C} = \frac{10^{-3,03}}{8,00 \times 10^{-3}} = 0,117 < 1$$

$$\text{A.7 } K_A = \frac{(9,33 \times 10^{-4})^2}{(8,00 \times 10^{-3} - 9,33 \times 10^{-4})} = 1,23 \times 10^{-4}$$

$$pK_A = -\log K_A = -\log(1,23 \times 10^{-4}) = 3,91$$

$$\text{A.8 } pK_{Am} = 3,87 \pm 0,03$$

$$\text{A.9 } \text{Lorsque } \% (AH) = \% (A^-) \quad pH = pK_{Aref}$$

$$\text{car } pH = pK_A + \log \left(\frac{[A^-]}{[AH]} \right)$$

$$\text{A.10 } z = \frac{|pK_{Aref} - pK_{Am}|}{u(pK_A)} = \frac{|3,87 - 3,90|}{0,03} = 1,00$$

$1 < 2$ donc pK_{Am} est conforme à la valeur de référence
 pK_{Aref}