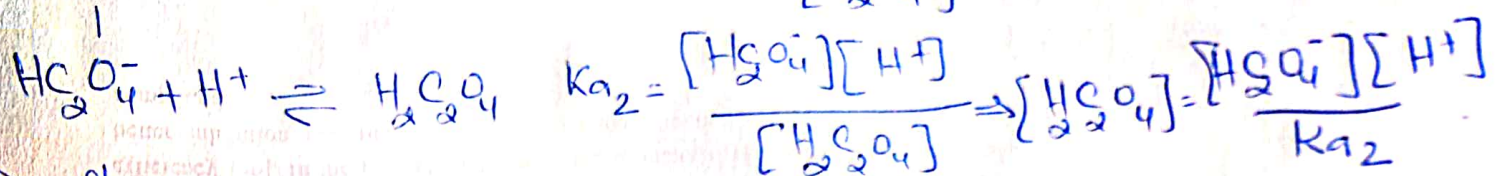
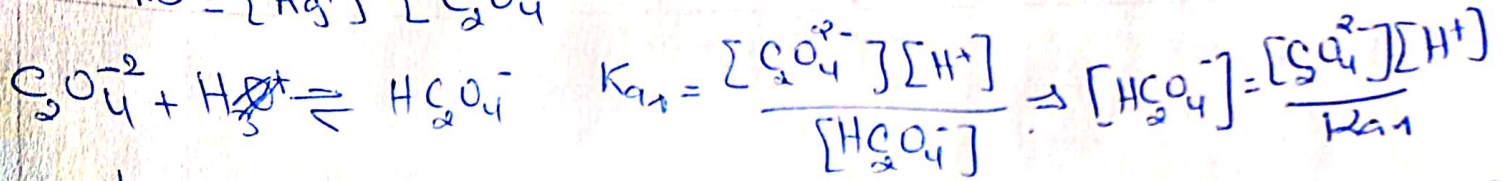


Démonstration:



$$K_s = [\text{Ag}^+]^2 [\text{C}_2\text{O}_4^{2-}]$$



De l'équation: $[\text{Ag}^+] = 2[\text{C}_2\text{O}_4^{2-}]$

De l'acide: $[\text{Ag}^+] = 2([\text{C}_2\text{O}_4^{2-}] + [\text{HC}_2\text{O}_4^-] + [\text{H}_2\text{C}_2\text{O}_4])$

$$\Rightarrow [\text{Ag}^+] = 2 \left([\text{C}_2\text{O}_4^{2-}] + \frac{[\text{C}_2\text{O}_4^{2-}][\text{H}^+]}{K_{a1}} + \frac{[\text{C}_2\text{O}_4^{2-}][\text{H}^+]^2}{K_{a1}K_{a2}} \right)$$

$$= 2 \left([\text{C}_2\text{O}_4^{2-}] + \frac{[\text{C}_2\text{O}_4^{2-}][\text{H}^+]}{K_{a1}} + \frac{[\text{C}_2\text{O}_4^{2-}][\text{H}^+]}{K_{a1}} \cdot \frac{[\text{H}^+]}{K_{a2}} \right) \quad [\text{H}^+] = 10^{-\text{pH}}$$

$$\Rightarrow [\text{Ag}^+] = 2[\text{C}_2\text{O}_4^{2-}] \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-2\text{pH}}}{K_{a1}K_{a2}} \right)$$

On a: $K_s = [\text{Ag}^+]^2 [\text{C}_2\text{O}_4^{2-}] \Rightarrow [\text{C}_2\text{O}_4^{2-}] = \frac{K_s}{[\text{Ag}^+]^2}$

$$\Rightarrow [\text{Ag}^+] = 2 \frac{K_s}{[\text{Ag}^+]^2} \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-2\text{pH}}}{K_{a1}K_{a2}} \right)$$

$$\Rightarrow [\text{Ag}^+][\text{Ag}^+]^2 = 2K_s \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-\text{pH}}}{K_{a1}K_{a2}} \right)$$

$$\Rightarrow [\text{Ag}^+]^3 = 2K_s \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-2\text{pH}}}{K_{a1}K_{a2}} \right) \quad \text{avec } [\text{Ag}^+] = 2s$$

$$(2s)^3 = 2K_s \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-2\text{pH}}}{K_{a1}K_{a2}} \right)$$

$$\Rightarrow s = \sqrt[3]{\frac{K_s}{4} \left(1 + \frac{10^{-\text{pH}}}{K_{a1}} + \frac{10^{-2\text{pH}}}{K_{a1}K_{a2}} \right)}$$