Conductimétrie

Conversions d'unité

1) $C = 1{,}20 \cdot 10^{-3}\ mol.L^{-1} = 1{,}20 \times 10^{-3}\ \frac{mol}{L} = 1{,}20 \cdot 10^{-3}\ \frac{mol}{10^{-3} m^3}$

$= 1{,}20\ mol.m^{-3}$

2. $C = 2{,}55 \cdot 10^{-3}\ mol.m^{-3} = 2{,}55 \times 10^{-3}\ \frac{mol}{m^3} = 2{,}55 \times 10^{-3}\ \frac{mol}{10^3 L} = 2{,}55 \cdot 10^{-6}\ mol.L^{-1}$

3) $\sigma = 0{,}465\ S.m^{-1} = 465\ mS.m^{-1}$

4 $\sigma = 3{,}86\ mS.cm^{-1} = 3{,}86 \times \frac{10^{-3} S}{10^{-2} m} = 3{,}86 \cdot 10^{-1}\ S.m^{-1}$

5 $\sigma = 7{,}59\ \mu S.cm^{-1} = 7{,}59 \times \frac{10^{-6} S}{10^{-2} m} = 7{,}59 \cdot 10^{-4}\ S.m^{-1}$

Etude d'une solution

1a $KNO_{3(s)} \xrightarrow{H_2O} K^+_{(aq)} + NO_3^-{}_{(aq)}$

1b $\sigma = \lambda_{K^+}[K^+] + \lambda_{NO_3^-}[NO_3^-]$ or $[K^+] = [NO_3^-]$ d'après la réaction

$\Rightarrow \sigma = [K^+] \times (\lambda_{K^+} + \lambda_{NO_3^-})$

$\Rightarrow [K^+] = \frac{\sigma}{(\lambda_{K^+} + \lambda_{NO_3^-})}$

$[K^+] = \frac{7{,}24 \times 10^{-3} \times 10^2}{(7{,}14 + 7{,}35) \times 10^{-3}} = 50\ mol.m^{-3} = \underline{5{,}0 \times 10^{-2}\ mol.L^{-1}}$

2a $\sigma = (\lambda_{K^+} + \lambda_{NO_3^-}) \times [NO_3^-]$

$= (7{,}14 + 7{,}35) \times 10^{-3} \times 4{,}0 \times 10^{-3} \times 10^{+3}$

$= \underline{5{,}8 \times 10^{-2}\ S.m^{-1}}$