

17.

$$F = 10 = \frac{C_{ma}}{C_{me}}$$

$$C_{ma} = F \cdot C_{me}$$

$$C_{me} = 96 \mu\text{g/l} \text{ } \text{SO}_4^{2-}$$

$$M = 96 \text{ g/mol}$$

$$C_{ma} = 960 \mu\text{g/l}$$

$$C_{ma} = 960 \cdot 10^{-6} \text{ g/l}$$

$$(1 \mu\text{g} = 10^{-6} \text{ g})$$

$$C_{ma} = 960 \cdot 10^{-6} \text{ g/l}$$

$$96 \text{ g} - 1 \text{ mol}$$

$$960 \cdot 10^{-6} \text{ g} - x$$

$$x = 10 \cdot 10^{-6} \text{ mol/l}$$

$$x = 1,0 \cdot 10^{-5} \text{ mol/l}$$

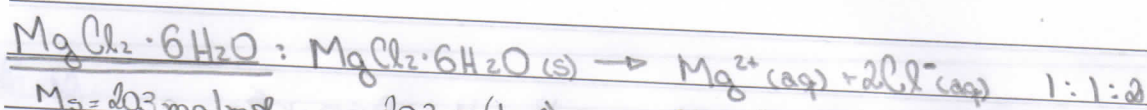
18. - Atividade prática 1

CuSO₄ · 5H₂O : CuSO₄ · 5H₂O (s) → Cu²⁺ (aq) + SO₄²⁻ (aq) 1:1:1

M = 250 g/mol	<u>Diluição concentrada:</u>	<u>Diluição diluída: C = Ci/F</u>
ms = 1,00 g		
Vi = 100 ml	[Cu ²⁺] = $\frac{n}{V} = \frac{4 \text{ mmol}}{0,1 \text{ L}} = 40 \text{ mmol/L}$	[Cu ²⁺] = $\frac{40 \text{ mmol/L}}{2,5} = 1,6 \text{ mmol/L}$
A = 10 ml	C _{Cu²⁺} = [Cu ²⁺] · M = 2560 mg/L	C _{Cu²⁺} = 2560 mg/L = 102,40 mg/L
$\eta = \frac{m}{M} = \frac{1}{250} = 4 \cdot 10^{-3} \text{ mol}$	[SO ₄ ²⁻] = $\frac{n}{V} = \frac{4 \text{ mmol}}{0,1 \text{ L}} = 40 \text{ mmol/L}$	[SO ₄ ²⁻] = $\frac{40 \text{ mmol/L}}{2,5} = 1,6 \text{ mmol/L}$
M 250	C _{SO₄²⁻} = [SO ₄ ²⁻] · M = 3840 mg/L	C _{SO₄²⁻} = 3840 mg/L = 153,6 mg/L
= 4 mmol	F = $\frac{V_f}{V_i} = \frac{250 \text{ ml}}{10 \text{ ml}} = 2,5$	
M _{Cu²⁺} = 64 mg/mol	A 10 ml	
M _{SO₄²⁻} = 96 mg/mol		

(NH₄)₂SO₄ : (NH₄)₂SO₄ (s) → 2NH₄⁺ (aq) + SO₄²⁻ (aq) 1:2:1

M _s = 132 mg/mol	<u>Diluição concentrada:</u>	<u>Diluição diluída:</u>
M _{NH₄⁺} = 18 mg/mol		
M _{SO₄²⁻} = 96 mg/mol	[NH ₄ ⁺] = $\frac{15,16 \text{ mmol}}{0,1 \text{ L}} = 151,6 \text{ mmol/L}$	[NH ₄ ⁺] = $\frac{151,6 \text{ mmol/L}}{2,5} = 6,064 \text{ mmol/L}$
$\eta = \frac{m_s}{M_s} = \frac{1}{132}$	C _{NH₄⁺} = [NH ₄ ⁺] · M _{NH₄⁺} = 2728,8 mg/L	C _{NH₄⁺} = 2728,8 mg/L = 109,152 mg/L
M _s 132	[SO ₄ ²⁻] = 7,58 mmol = 75,8 mmol	[SO ₄ ²⁻] = $\frac{75,8 \text{ mmol/L}}{2,5} = 3,032 \text{ mmol/L}$
$\eta_s = 7,58 \text{ mmol}$	C _{SO₄²⁻} = [SO ₄ ²⁻] · M _{SO₄²⁻} = 7276,8 mg/L	C _{SO₄²⁻} = 7276,8 mg/L = 291,072 mg/L
$\eta_{\text{NH}_4^+} = 2 \eta_s = 15,16 \text{ mmol}$	F = $\frac{V_f}{V_i} = \frac{250 \text{ ml}}{10 \text{ ml}} = 2,5$	
$\eta_{\text{SO}_4^{2-}} = \eta_s = 7,58 \text{ mmol}$	A 10 ml	



$$M_s = 203 \text{ mg/mel} \quad 203 \text{ g (1mel)} \quad \text{---} \quad 24 \text{ g (1mel)} \quad \text{---} \quad 71 \text{ g (2mel)}$$

Solução concentrada

1 g

x

y

$$x = 0,11822 \text{ g Mg}^{2+} \text{ em } 100 \text{ ml}$$

$$C_{\text{Mg}^{2+}} = \frac{118,22 \text{ mg}}{0,1 \text{ L}} = \underline{\underline{1182,2 \text{ mg/L}}}$$

$$[\text{Mg}^{2+}] = \frac{C_{\text{Mg}^{2+}}}{M_{\text{Mg}^{2+}}} = \frac{1182,2 \text{ mg/L}}{24 \text{ mg/mmol}} = \underline{\underline{49,3 \text{ mmol/L}}}$$

$$C_A = \frac{m_A}{V}$$

$$m_A = \eta_A \cdot M_A$$

$$C_A = \frac{\eta_A \cdot M_A}{V}$$

$$[A] = \eta_A / V$$

$$\eta_A = \frac{m_A}{M_A}$$

$$C_A = [A] \cdot M_A$$

$$[A] = C_A / M_A$$

$$y = 0,349754 \text{ g Cl}^- \text{ em } 100 \text{ ml}$$

$$C_{\text{Cl}^-} = \frac{349,754 \text{ mg}}{0,1 \text{ L}} = \underline{\underline{3497,54 \text{ mg/L}}}$$

$$[\text{Cl}^-] = \frac{C_{\text{Cl}^-}}{M_{\text{Cl}^-}} = \frac{3497,54 \text{ mg/L}}{35,5 \text{ mg/mel}} = \underline{\underline{98,6 \text{ mmol/L}}}$$

Solução diluída:

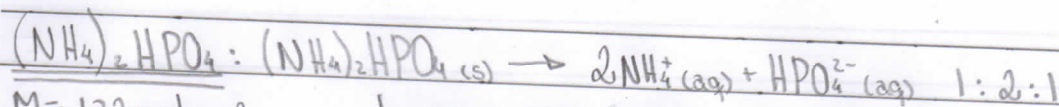
$$C_1 V_1 = C_2 V_2 \rightarrow C_2 = \frac{C_1 V_1}{V_2} \quad (V_1 \rightarrow \text{aliquota})$$

$$C'_{\text{Mg}^{2+}} = \frac{1182,2 \text{ mg/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = \underline{\underline{47,3 \text{ mg/L}}}$$

$$[\text{Mg}^{2+}]' = \frac{47,3 \text{ mmol/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = \underline{\underline{1,97 \text{ mmol/L}}}$$

$$C'_{\text{Cl}^-} = \frac{3497,54 \text{ mg/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = \underline{\underline{139,90 \text{ mg/L}}}$$

$$[\text{Cl}^-]' = \frac{139,90 \text{ mmol/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = \underline{\underline{5,596 \text{ mmol/L}}}$$



$$M = 132 \text{ mg/mmol} \quad 1 \text{ mmol} \text{ --- } 2 \text{ mmol} \text{ --- } 1 \text{ mmol}$$

$$\eta = m = 1 = 7,58 \text{ mmol} \quad 7,58 \text{ mmol} \text{ --- } x \text{ --- } y$$

$$M \quad 132$$

Solução concentrada

$$x = 15,16 \text{ mmol em } 100 \text{ mL}$$

$$y = 7,58 \text{ mmol em } 100 \text{ mL}$$

$$[NH_4^+] = \frac{15,16 \text{ mmol}}{0,1 \text{ L}} = 151,6 \text{ mmol/L}$$

$$[HPO_4^{2-}] = \frac{7,58 \text{ mmol}}{0,1 \text{ L}} = 75,8 \text{ mmol/L}$$

$$C_{NH_4^+} = [NH_4^+] \cdot M_{NH_4^+} = 2728,8 \text{ mg/L}$$

$$C_{HPO_4^{2-}} = [HPO_4^{2-}] \cdot M_{HPO_4^{2-}} = 7276,8 \text{ mg/L}$$

\downarrow
 96 mg/mmol

Solução diluída: $C_2 = \frac{C_1 V_1}{V_2}$

$$[NH_4^+] = \frac{151,6 \text{ mmol/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = 6,064 \text{ mmol/L}$$

$$[HPO_4^{2-}] = \frac{75,8 \text{ mmol/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = 3,032 \text{ mmol/L}$$

$$C_{NH_4^+} = \frac{2728,8 \text{ mg/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = 109,152 \text{ mg/L}$$

$$C_{HPO_4^{2-}} = \frac{7276,8 \text{ mg/L} \cdot 10 \text{ mL}}{250 \text{ mL}} = 291,1 \text{ mg/L}$$