

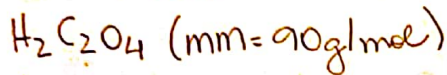
CEN 5806: Fundamentos de Química Aplicados à
Agricultura e meio Ambiente.

Nome: Luís Claudio Martins

nº USP 9370351

AVALIAÇÃO I

1 a- Ácido oxálico



P = 98%

$$\begin{array}{l} 98 \text{ g} \text{ --- } 100 \text{ g} \\ x \text{ --- } 3,6734 \text{ g} \\ x = 3,5999 \text{ g de } \text{H}_2\text{C}_2\text{O}_4 \end{array}$$

$$\begin{array}{l} 3,5999 \text{ g } \text{H}_2\text{C}_2\text{O}_4 \text{ --- } 250 \text{ mL} \\ \text{--- } 1000 \text{ mL} \\ y \\ y = 14,4 \text{ g/L} \end{array}$$

∴ A concentração é de 14,4 g/L nesta solução

b- 1 mol $\text{H}_2\text{C}_2\text{O}_4$ --- 90 g
 x --- 14,4 g
 $x = 0,16 \text{ mol}$

$$\begin{array}{l} C_1 V_1 = C_2 V_2 \\ 0,16 \frac{\text{mol}}{\text{L}} \cdot 5 \text{ mL} = C_2 \cdot 100 \text{ mL} \\ C_2 = 8 \times 10^{-3} \frac{\text{mol}}{\text{L}} \end{array}$$

∴ Nesta solução a concentração molar é de $8 \times 10^{-3} \text{ mol/L}$

2 H_2SO_4 conc

P = 95%

$$d = 1,84 \text{ g/mL}$$

$$\text{mm} = 98 \text{ g/mol}$$

a- 1 mL --- 1,84 g H_2SO_4
1200 mL --- x
 $x = 2208 \text{ g}$

$$\begin{array}{l} 95 \text{ g} \text{ --- } 100 \text{ g} \\ y \text{ --- } 2208 \text{ g} \\ y = 2097,6 \text{ g} \end{array}$$

∴ Em 1,2 L de solução possui 2097,6 g de H_2SO_4

b- 2097,6 g --- 1200 mL
 x --- 1000 mL
 $x = 1748 \text{ g/L}$

$$\begin{array}{l} 1 \text{ mol} \text{ --- } 98 \text{ g} \\ y \text{ --- } 1748 \text{ g} \\ y = 17,84 \text{ mol/L} \end{array}$$

∴ Nesta solução a concentração molar é de 17,84 mol/L

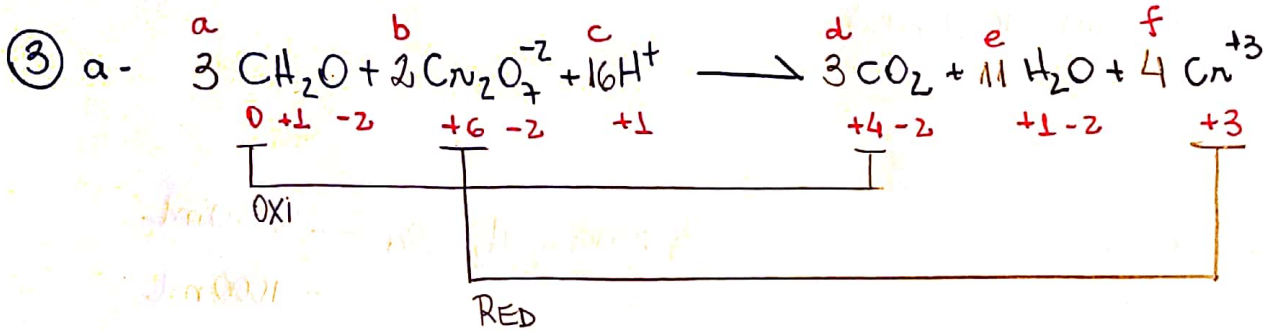
$$c - C_1 V_1 = C_2 V_2$$

$$1748 \text{ g/L} \cdot V_1 = 25 \text{ g/L} \cdot 0,25 \text{ L}$$

$$V = 0,0036 \text{ L}$$

ou 3,6 ml

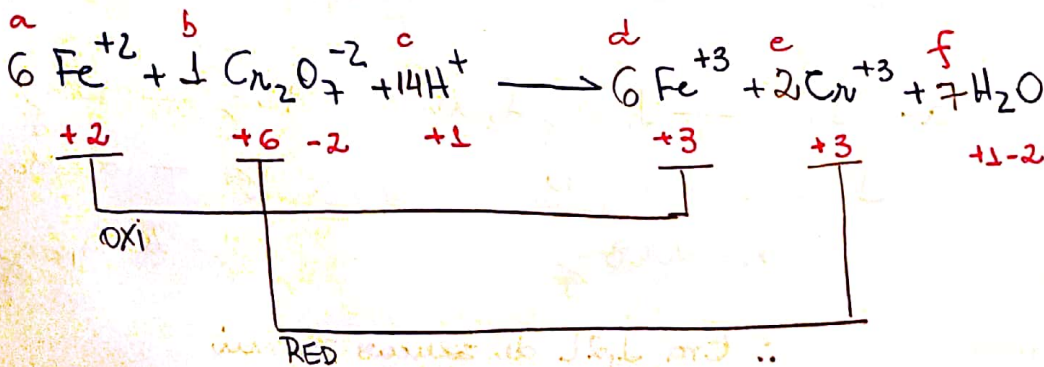
∴ Para preparar uma solução
25 g/L é necessário 3,6 ml.



(C) OXIDAÇÃO → $\Delta \text{NOX} = 4 \times 1 = 4 \div 2 = 2$ (3)

(Cr₂) REDUÇÃO → $\Delta \text{NOX} = 3 \times 2 = 6 \div 2 = 3$ (2)

$$\begin{array}{l}
 a = 3 \quad c = ? \quad \text{H} \rightarrow 2a + c = 2e \rightarrow c = 16 \\
 b = 2 \quad e = ? \\
 d = 3 \\
 f = 4 \\
 \text{O} \rightarrow a + 7b = 2d + e \\
 3 + 14 = 6 + e \\
 e = 11
 \end{array}$$



(Fe) OXIDAÇÃO → $\Delta \text{NOX} = 1 \times 1 = 1$ (6)

(Cr) REDUÇÃO → $\Delta \text{NOX} = 3 \times 2 = 6$ (1)

$a = 6$

$b = 1$

$c = ? = 14$

$d = 6$

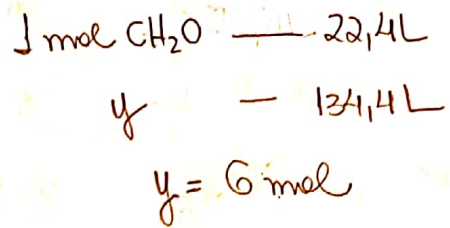
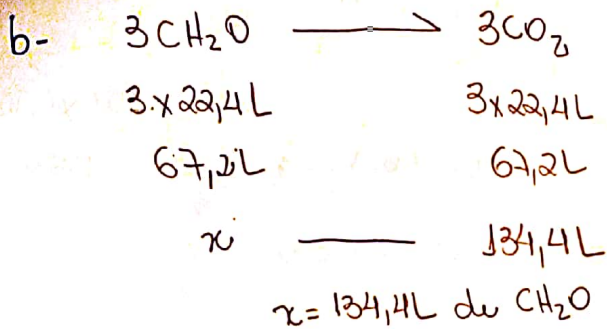
$e = 2$

$f = ? = 7$

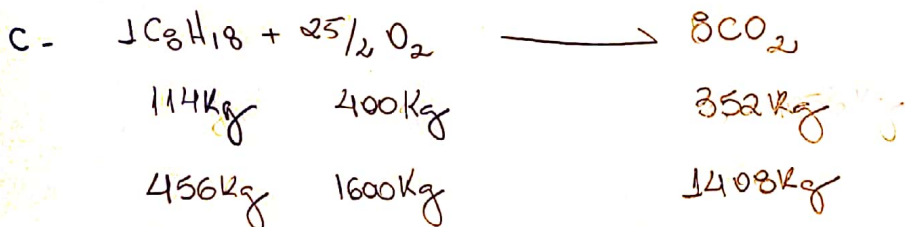
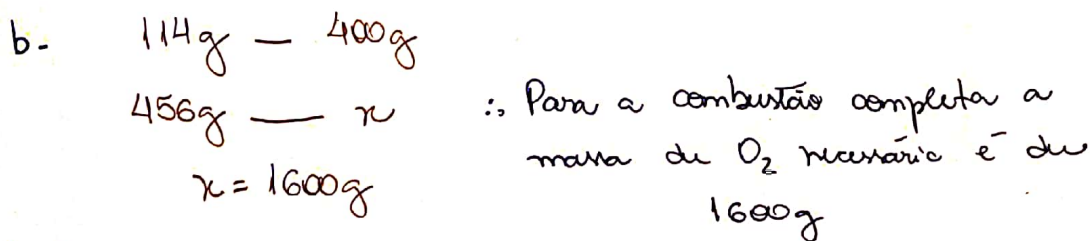
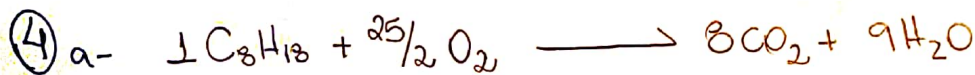
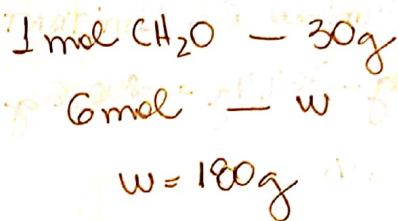
$\text{H} \rightarrow c = 2f \rightarrow 14$

$\text{O} \rightarrow 7b = f$

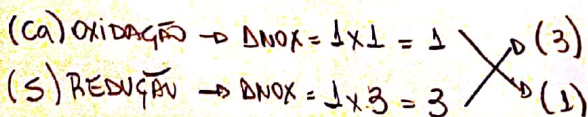
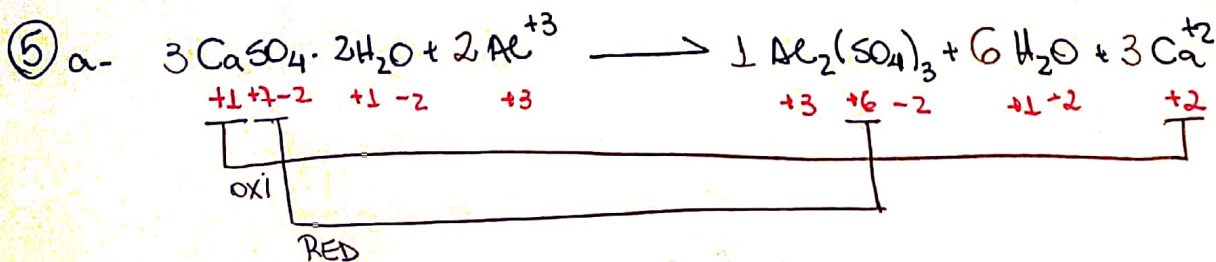
$f = 7$

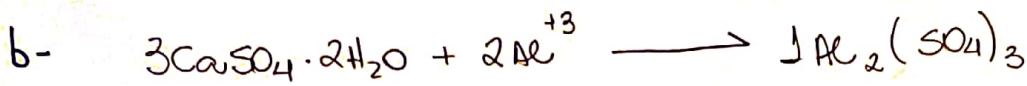


∴ A massa de matéria orgânica foi de 180g



$$\text{Rendimento(\%)} = \frac{1056\text{Kg}}{1408\text{Kg}} \times 100 = 75\%$$





516g

54g

342g

P/Al

$x = 764,4\text{g}$

80g

$y = 506,7\text{g} //$

2/º produto

965g

$x = 101\text{g}$

$y = 639,6\text{g}$

$$1000 \times 0,965 = 965\text{g}$$

∴ O alumínio é o LIMITANTE

$965\text{g} - 764,4\text{g} = 200,6\text{g}$ é a massa de reagente em excesso.