



1. Resolução:

$$MM_{H_2C_2O_4} = 90 \text{ g/mol}$$

$$p = 98\%$$

a) Considerando a pureza:

$$100 \text{ g de material} \quad \text{-----} \quad 98 \text{ g de } H_2C_2O_4$$

$$3,6734 \text{ g de material} \quad \text{-----} \quad x$$

$$X = 3,59 \text{ g de } H_2C_2O_4$$

Concentração:

$$3,59 \text{ g de } H_2C_2O_4 \quad \text{-----} \quad 250 \text{ ml}$$

$$y \quad \text{-----} \quad 1000 \text{ ml}$$

$$y = 14,36 \text{ g/L de } H_2C_2O_4$$

b)  $C_1 \cdot V_1 = C_2 \cdot V_2$

$$14,36 \text{ g/L} \cdot 0,005 \text{ L} = x \cdot 0,1 \text{ L}$$

$$X = 0,718 \text{ g/L}$$

$$M = C/MM = 0,718 \text{ g/L} / 90 \text{ g/mol}$$

$$M = 0,00797 \text{ mol/L ou } 7,97 \text{ mmol/L}$$

2. Resolução:

$$MM_{H_2SO_4} = 97 \text{ g/mol}$$

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

$$W = 95 \%$$

a)  $d = m/v$

$$m = d \cdot v = 1,84 \text{ g/ml} \cdot 1200 \text{ ml} = 2208 \text{ g de solução total}$$

$$W = m_i / m_{total}$$

$$m_i = W \cdot m_{total} = 0,95 \cdot 2208 \text{ g} = 2097,6 \text{ g ou } 2,1 \text{ kg de } H_2SO_4$$

b)  $M = m/MM/V = 2100 \text{ g} / 97 \text{ g/mol} / 1,2 \text{ L} = 18 \text{ mol/L}$

c) Considerando:

$$2100 \text{ g} \quad \text{----} \quad 1,2 \text{ L}$$

$$X \quad \text{-----} \quad 1 \text{ L}$$

$$X = 1750 \text{ g}$$

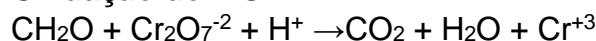
$$C_1 \cdot V_1 = C_2 \cdot V_2$$

$$1750 \text{ g/L} \cdot x = 25 \text{ g/L} \cdot 0,250 \text{ L}$$

$$X = 0,0035 \text{ L ou } 3,5 \text{ mL}$$

3. Resolução:

a) **Oxidação do MO**



Cr: redução

C: oxidação

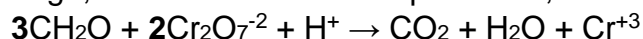
+ 3 e<sup>-</sup> por átomo de Cr

Então, 3 e<sup>-</sup> x 2 átomos de Cr = Δ 6 e<sup>-</sup>

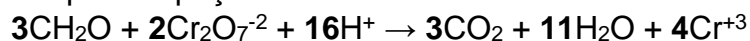
- 4 e<sup>-</sup> por átomo de C

Então, 4 e<sup>-</sup> x 1 átomo de C = Δ 4 e<sup>-</sup>

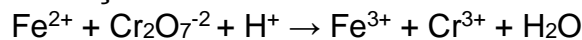
Logo, nCr = 4 e nC = 6. Simplificando, nCr = 2 e nC = 3.



Simplex inspeção:



### Titulação do dicromato



Cr: redução

Fe: oxidação

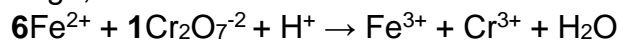
+ 3 e<sup>-</sup> por átomo de Cr

Então, 3 e<sup>-</sup> x 2 átomos de Cr = Δ 6 e<sup>-</sup>

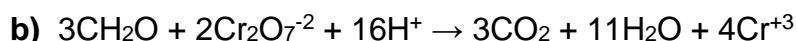
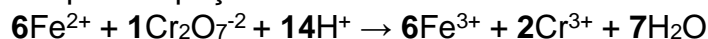
- 1 e<sup>-</sup> por átomo de Fe

Então, 1 e<sup>-</sup> x 1 átomo de Fe = Δ 1 e<sup>-</sup>

Logo, nCr = 1 e nFe = 6.



Simple inspection:



MM<sub>CH<sub>2</sub>O</sub> = 30 g/mol

3 . 30 g de CH<sub>2</sub>O ----- 3 . 22,4 L de CO<sub>2</sub>

x ----- 134,4 L de CO<sub>2</sub>

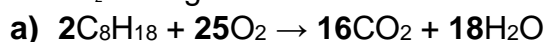
X = **180 g de CH<sub>2</sub>O**

#### 4. Resolução:

MM<sub>C<sub>8</sub>H<sub>18</sub></sub> = 114 g/mol

MM<sub>O<sub>2</sub></sub> = 32 g/mol

MM<sub>CO<sub>2</sub></sub> = 44 g/mol



b) 2 . 114 g de C<sub>8</sub>H<sub>18</sub> ----- 25 . 32 g de O<sub>2</sub>

456 g de C<sub>8</sub>H<sub>18</sub> ----- x

X = **1600 g de O<sub>2</sub>**

c) Rendimento = Qtd. Obtida / Qtd. Esperada x 100

Quantidade esperada de CO<sub>2</sub> = 640 g

Quantidade obtida de CO<sub>2</sub> = 1056 g

R = 1056 / 640 x 100

R = **165%**

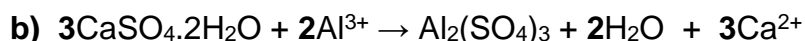
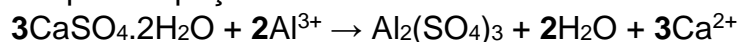


#### 5. Resolução:

MM<sub>CaSO<sub>4</sub>.2H<sub>2</sub>O</sub> = 172 g/mol

MM<sub>Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub></sub> = 342 g/mol

a) Simple inspection



Est. 516 g 54g 342 g 36g 120g

P/ o compost. **1000g** x = 105 g y = 663 g z = 70 g w = 232,5 g

P/ o Alumínio x = 764,5 **80g** y = 506 g z = 53 g w = 177 g

Reagente limitante: **Alumínio (Al)**

Qtd. em excesso: 1000 g – 764,5 g = **235,5 g**

