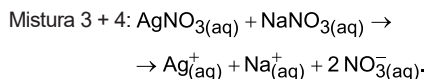
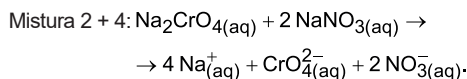
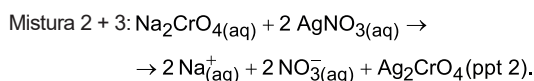
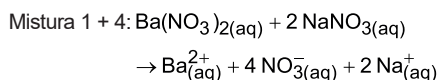
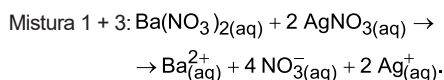
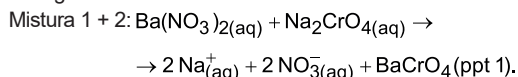




Professor: Milton Soares					
1	2	3	4	5	6
D	B	B	E	A	B
7	8	9	10	11	12
A	E	B	E	B	D
13	14	15	16		
D	E	C	A		

- [A] Incorreta. Os compostos [I] e [III] são ácidos e os compostos [V] e [VI] são sais.
 [B] Incorreta. Os compostos [I] e [III] são ácidos e o composto [VI] é um sal.
 [C] Incorreta. O composto [II] é um ácido e os compostos [V] e [VI] são sais.
 [D] Correta. Os compostos [III] e [IV] pertencem à função base.
 [E] Incorreta. Os compostos [I] e [II] são ácidos; [III] e [IV] são bases e os compostos [V] e [VI] são sais.

- Sais do grupo 1 da tabela periódica (Na^+) e nitratos (NO_3^-) são solúveis em água. Então:



- 5 milhões de anos = 5×10^6 anos = $5 \times 10^6 \times 365$ dias =
 $= 5 \times 10^6 \times 365 \times 24 \times 60 \times 60$ s

A cada segundo (s), por cm^2 :

100 bilhões de átomos de hidrogênio = 100×10^9 átomos de H

$6,0 \times 10^{23}$ átomos de H ——— 1 g

100×10^9 átomos de H ——— m_H

$$m_H = \frac{100 \times 10^9 \text{ átomos de H} \times 1 \text{ g}}{6,0 \times 10^{23} \text{ átomos de H}} = \frac{1}{6} \times 10^{-12} \text{ g}$$

$\frac{1}{6} \times 10^{-12}$ g de H ——— 1 s

m'_H ——— $5 \times 10^6 \times 365 \times 24 \times 60 \times 60$ s

$$m'_H = \frac{\left(\frac{1}{6} \times 10^{-12} \text{ g}\right) \times 5 \times 10^6 \times 365 \times 24 \times 60 \times 60 \text{ s}}{1 \text{ s}}$$

$$m'_H = 26280000 \times 10^{-6} \text{ g} = 26,28 \text{ g}$$

$$m'_H = 26 \text{ g}$$

- $\text{C}_5\text{H}_8\text{NO}_4\text{Na}$ (Glutamato monossódico) =
 $= 5 \times 12 + 8 \times 1 + 1 \times 14 + 4 \times 16 + 1 \times 23 = 169$
 $M_{\text{C}_5\text{H}_8\text{NO}_4\text{Na}} = 169 \text{ g} \cdot \text{mol}^{-1}$
 1 mol de $\text{C}_5\text{H}_8\text{NO}_4\text{Na}$ tem 1 mol de Na, então:

169 g de $\text{C}_5\text{H}_8\text{NO}_4\text{Na}$ ——— 23 g de Na

0,1 g de $\text{C}_5\text{H}_8\text{NO}_4\text{Na}$ ——— m_{Na}

$$m_{\text{Na}} = \frac{0,1 \text{ g} \times 23 \text{ g}}{169 \text{ g}} = 0,0136 \text{ g} = 13,6 \times 10^{-3} \text{ g}$$

$$m_{\text{Na}} = 13,6 \text{ mg}$$

- 1 quilate ——— 200×10^{-3} g

900 quilate ——— m

$$m = \frac{900 \text{ quilates} \times 200 \times 10^{-3} \text{ g}}{1 \text{ quilate}}$$

$$m = 180 \text{ g}$$

$$C = 12; M_C = 12 \text{ g} \cdot \text{mol}^{-1}$$

1 mol de átomos de carbono ——— 12 g

n ——— 180 g

$$n = \frac{1 \text{ mol} \times 180 \text{ g}}{12 \text{ g}}$$

$$n = 15 \text{ mol}$$

$$n = 1,5 \times 10^1 \text{ mol}$$

- $1,0 \text{ mg} \cdot \text{kg}^{-1} = \frac{1,0 \text{ mg de Pb}}{1,0 \text{ kg de batom}} = \frac{1,0 \text{ mg de Pb} \times 10^{-4}}{1000 \text{ g de batom} \times 10^{-4}} =$

$$= \frac{10^{-4} \text{ mg de Pb}}{100 \text{ mg de batom}}$$

$$m_{\text{Pb}} = 10^{-4} \text{ mg} = 10^{-4} \times 10^{-3} \text{ g} = 10^{-7} \text{ g}$$

$$M_{\text{Pb}} = 207 \text{ g} \cdot \text{mol}^{-1}$$

$$n_{\text{Pb}} = \frac{m_{\text{Pb}}}{M_{\text{Pb}}} = \frac{10^{-7} \text{ g}}{207 \text{ g} \cdot \text{mol}^{-1}} = \frac{1}{207} \times 10^{-7} \text{ mol}$$

$$N_A = 6,0 \times 10^{23} \text{ mol}^{-1}$$

$$\text{Número de átomos de chumbo} = \frac{1}{207} \times 10^{-7} \text{ mol} \times 6,0 \times 10^{23} \text{ mol}^{-1}$$

$$\text{Número de átomos de chumbo} = 0,02898 \times 10^{16} \approx 2,9 \times 10^{14}$$

- $\text{NaCl} \rightarrow \text{Na}^+ + \text{Cl}^-$

58,5 g ——— 1 mol de Na^+

58,5 g ——— $6,0 \times 10^{23}$ cátions Na^+

Então:

58,5 g ——— $6,0 \times 10^{23} \times (+1,6 \times 10^{-19} \text{ C})$

$117 \times 10^{-3} \text{ g}$ ——— Q

$$Q = \frac{117 \times 10^{-3} \text{ g} \times 6,0 \times 10^{23} \times (+1,6 \times 10^{-19} \text{ C})}{58,5 \text{ g}}$$

$$Q = 192 \text{ C} = 1,92 \times 10^2 \text{ C}$$

- Foram submetidos dez gramas de moedas a uma sequência de reações e as massas de óxidos de cobre e estanho obtidas foram, respectivamente, de 7,51 g e 4,54 g.

7,51 g de CuO em 10 g de moedas.

4,54 g de SnO em 10 g de moedas.

$\text{Cu} = 63,6$; $\text{CuO} = 63,5 + 16 = 79,5$.

1 mol de CuO ——— 1 mol de Cu

79,5 g ——— 63,5 g

7,51 g ——— m_{Cu}

$$m_{\text{Cu}} \approx 5,998 \text{ g} \approx 6 \text{ g}$$

$$p_{\text{Cu}} \approx \frac{6 \text{ g}}{10 \text{ g}} \approx 60\%$$

$\text{Sn} = 118,7$; $\text{SnO} = 118,7 + 16 = 134,7$.

1 mol de SnO ——— 1 mol de Sn

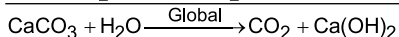
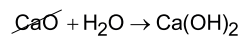
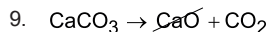
134,7 g ——— 118,7 g

4,54 g ——— m_{Sn}



$$m_{\text{Sn}} \approx 4 \text{ g}$$

$$p_{\text{Sn}} \approx \frac{4 \text{ g}}{10 \text{ g}} \approx 40\%$$



$$\text{CaCO}_3 = 40 + 12 + 3 \times 16 = 100$$

$$\text{Ca(OH)}_2 = 40 + (16 + 1) \times 2 = 74$$

$$\text{Rendimento} = 80\% = \frac{80}{100} = 0,80$$

$$\text{Pureza} = 65\% = \frac{65}{100} = 0,65$$

$$1 \text{ t} = 1000 \text{ kg}$$

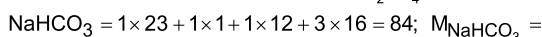
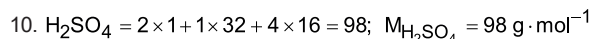


$$100 \text{ g} \text{ ————— } 74 \times 0,80$$

$$1000 \text{ kg} \times 0,65 \text{ ————— } m_{\text{Ca(OH)}_2}$$

$$m_{\text{Ca(OH)}_2} = \frac{1000 \text{ kg} \times 0,65 \times 74 \times 0,80}{100 \text{ g}} = 384,8 \text{ kg}$$

$$m_{\text{Ca(OH)}_2} \approx 385 \text{ kg}$$



$$= 84 \text{ g} \cdot \text{mol}^{-1}$$

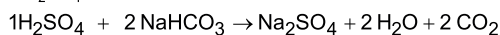
$$V_{\text{H}_2\text{SO}_4} \text{ (solução)} = 200 \text{ mL} = 0,2 \text{ L}$$

$$[\text{H}_2\text{SO}_4] = 0,1 \text{ mol} \cdot \text{L}^{-1}$$

$$[\text{H}_2\text{SO}_4] = \frac{n_{\text{H}_2\text{SO}_4}}{V_{\text{H}_2\text{SO}_4} \text{ (solução)}} \Rightarrow 0,1 \text{ mol} \cdot \text{L}^{-1} = \frac{n_{\text{H}_2\text{SO}_4}}{0,2 \text{ L}}$$

$$n_{\text{H}_2\text{SO}_4} = 0,1 \text{ mol} \cdot \text{L}^{-1} \times 0,2 \text{ L} = 0,02 \text{ mol}$$

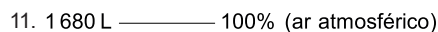
$$m_{\text{H}_2\text{SO}_4} = 0,02 \text{ mol} \times 98 \text{ g} \cdot \text{mol}^{-1} = 1,96 \text{ g}$$



$$98 \text{ g} \text{ ————— } 2 \times 84 \text{ g}$$

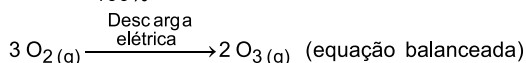
$$1,96 \text{ g} \text{ ————— } m_{\text{NaHCO}_3}$$

$$m_{\text{NaHCO}_3} = \frac{1,96 \text{ g} \times 2 \times 84 \text{ g}}{98 \text{ g}} = 3,36 \text{ g}$$



$$V_{\text{O}_2} \text{ ————— } 20\%$$

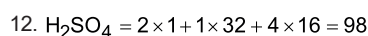
$$V_{\text{O}_2} = \frac{1680 \text{ L} \times 20\%}{100\%} = 336 \text{ L}$$



$$3 \times 22,4 \text{ L} \text{ ————— } 2 \times 22,4 \text{ L} \times \left(\frac{70}{100} \right)$$

$$336 \text{ L} \text{ ————— } V_{\text{O}_3}$$

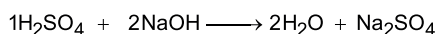
$$V_{\text{O}_3} = \frac{336 \text{ L} \times 2 \times 22,4 \text{ L} \times \left(\frac{70}{100} \right)}{3 \times 22,4 \text{ L}} = 156,8 \text{ L}$$



$$M_{\text{H}_2\text{SO}_4} = 98 \text{ g/mol}$$

$$\text{NaOH} = 1 \times 23 + 1 \times 16 + 1 \times 1 = 40$$

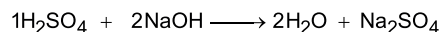
$$M_{\text{NaOH}} = 40 \text{ g/mol}$$



$$98 \text{ g} \text{ ————— } 2 \times 40 \text{ g}$$

$$245 \text{ g} \text{ ————— } 100 \text{ g}$$

$$\left(\frac{\text{Massa em excesso}}{2 \times 40 \times \frac{245}{19.600}} \right) > \left(\frac{98 \times 100}{9.800} \right)$$

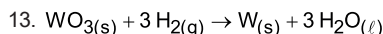


$$98 \text{ g} \text{ ————— } 2 \times 40 \text{ g}$$

$$m_{\text{H}_2\text{SO}_4} \text{ ————— } 100 \text{ g}$$

$$m_{\text{H}_2\text{SO}_4} = \frac{98 \text{ g} \times 100 \text{ g}}{2 \times 40 \text{ g}} = 122,5 \text{ g}$$

$$m_{\text{H}_2\text{SO}_4} \text{ em excesso} = 245 \text{ g} - 122,5 \text{ g} = 122,5 \text{ g}$$



$$231,8 \text{ g} \text{ ————— } 183,8 \text{ g}$$

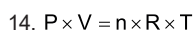
$$50 \text{ kg} \text{ ————— } x$$

$$x = 39,64 \text{ kg}$$

$$39,64 \text{ kg} \text{ ————— } 100\%$$

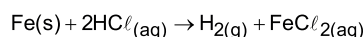
$$31,70 \text{ kg} \text{ ————— } y$$

$$y \approx 80\%$$



$$2,46 \times 1 = n_{\text{H}_2} \times 0,082 \times (27 + 273)$$

$$n_{\text{H}_2} = 0,1 \text{ mol}$$



$$56 \text{ g} \text{ ————— } 1 \text{ mol}$$

$$p \times 11,2 \text{ g} \text{ ————— } 0,1 \text{ mol}$$

$$p = 0,50 = 50\% \text{ (teor de ferro)}$$



$$\frac{P_{\text{inicial}} \times V}{T_{\text{inicial}}} = \frac{P_{\text{final}} \times V}{T_{\text{final}}}$$

$$\frac{P_{\text{inicial}}}{T_{\text{inicial}}} = \frac{P_{\text{final}}}{T_{\text{final}}}$$

$$T_{\text{inicial}} = 30 \text{ }^\circ\text{C} + 273 = 303 \text{ K}$$

$$P_{\text{inicial}} = 2 \text{ atm}$$

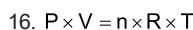
$$T_{\text{final}} = 303 \text{ K} + 150 \text{ K} = 453 \text{ K}$$

$$\frac{P_{\text{inicial}}}{T_{\text{inicial}}} = \frac{P_{\text{final}}}{T_{\text{final}}}$$

$$\frac{2 \text{ atm}}{303 \text{ K}} = \frac{P_{\text{final}}}{453 \text{ K}}$$

$$P_{\text{final}} = \frac{2 \text{ atm}}{303 \text{ K}} \times 453 \text{ K}$$

$$P_{\text{final}} = 2,99 \text{ atm (aproximadamente 3 atm)}$$



$$n = \frac{P \times V}{R \times T}$$

$$p_A = 2p_B$$

$$T_A = 5T_B$$

$$n_A = 4n_B$$

$$V_A = 5 \text{ L} = 5000 \text{ mL}$$

$$n_A = 4n_B$$

$$\frac{P_A \times V_A}{R \times T_A} = 4 \times \frac{P_B \times V_B}{R \times T_B}$$

$$\frac{2 p_B \times 5000 \text{ mL}}{5 T_B} = 4 \times \frac{p_B \times V_B}{T_B}$$

$$V_B = \frac{2 \times 5000 \text{ mL}}{5 \times 4}$$

$$V_B = 500 \text{ mL}$$