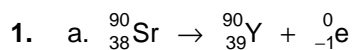




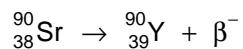
SUGESTÕES DE RESPOSTAS PARA AS QUESTÕES ABERTAS – APLICAÇÃO: 10/01/2005

ÁREA 2

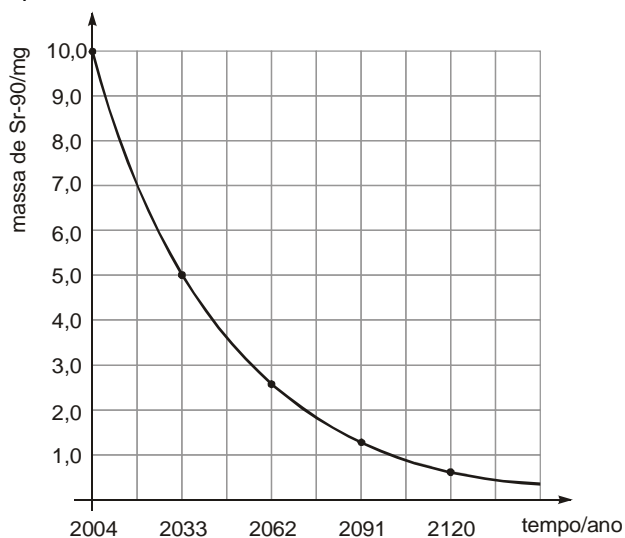
Química



ou

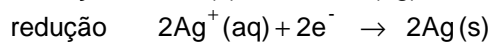
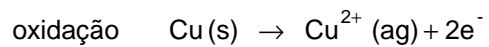
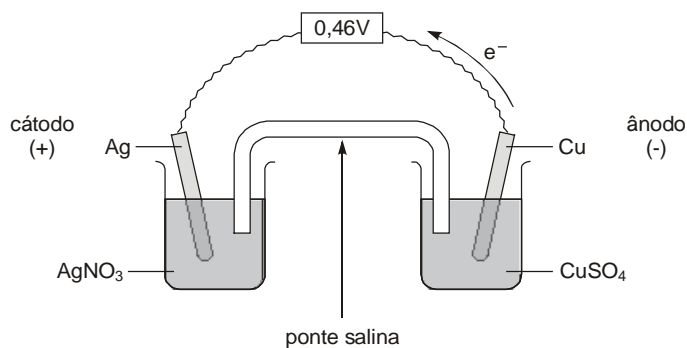


b.

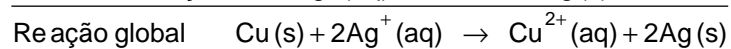


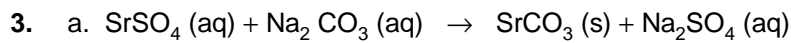
c. Cerca de 1,0 mg

2. a.

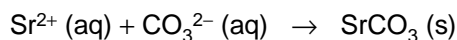


b.





ou

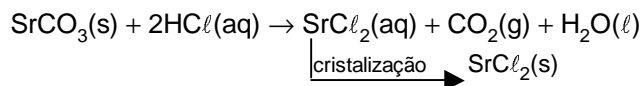


b. $1 \text{ t SrCO}_3 \times \frac{106 \text{ t Na}_2\text{CO}_3}{148 \text{ t SrCO}_3} = 0,72 \text{ t de Na}_2\text{CO}_3 \text{ puro}$

Quantidade de solução:

$$\begin{aligned} 0,72 \text{ t} - 10\% \\ x - 100\% \end{aligned} \Rightarrow 7,2 \text{ t de solução de Na}_2\text{CO}_3$$

c. Pode ser obtido por reação do SrCO_3 com HCl em proporções adequadas. A seguir cristaliza-se o SrCl_2 por evaporação:



4. a. $P_1 = \frac{d_1}{M} RT_1 \quad P_2 = \frac{d_2}{M} RT_2 \quad (273 + 27)\text{K} = 300\text{K}$

$$R = \frac{P_1 M}{d_1 T_1} \quad R = \frac{P_2 M}{d_2 T_2} \quad (273 - 23)\text{K} = 250\text{K}$$

$$\text{logo, } \frac{P_1}{d_1 T_1} = \frac{P_2}{d_2 T_2}$$

$$\frac{1 \text{ atm}}{1,2 \text{ g/L} \times 300\text{K}} = \frac{0,6 \text{ atm}}{d_2 \times 250\text{K}} \Rightarrow d_2 = \frac{0,6 \text{ atm} \times 1,2 \text{ g/L} \times 300\text{K}}{250\text{K} \times 1 \text{ atm}}$$

$$d_2 = 0,86 \text{ g/L}$$

b. Em nível do mar:

$$d = \frac{1,2 \text{ g}}{\text{L}} = \frac{m}{V} \Rightarrow m = 1,2 \text{ g/L} \times 100 \text{ L} = 120 \text{ g de ar}$$

Na altitude considerada:

$$\frac{0,86 \text{ g}}{\text{L}} = \frac{120 \text{ g}}{V} \Rightarrow V = \frac{120 \text{ g}}{0,86 \text{ g/L}} = 139,5 \text{ L} \approx 140 \text{ L}$$



5. a. $\text{pH} = -\log [\text{H}^+]$
 $\text{pH} = -\log 1 \times 10^{-2}$
 $\text{pH} = 2$

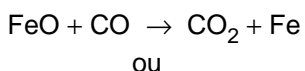
Logo, o indicador deve apresentar a cor amarela.

- b. pH médio da faixa de viragem = 7 $\therefore [\text{H}^+] = 10^{-7} \text{ mol/L}$

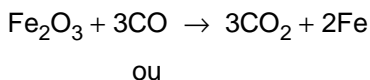
$$\frac{[\text{H}^+]_{\text{final}}}{[\text{H}^+]_{\text{inicial}}} = \frac{10^{-7} \text{ mol/L}}{10^{-10} \text{ mol/L}} = 10^3$$

Logo, a solução deve ser diluída de 1000 vezes, pois $[\text{H}^+]$ deve crescer 1 000 vezes.

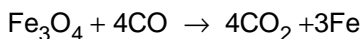
6. Ferro



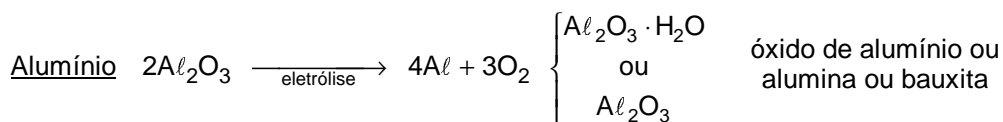
FeO óxido de ferro (II)



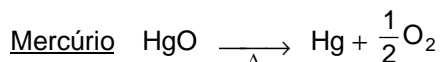
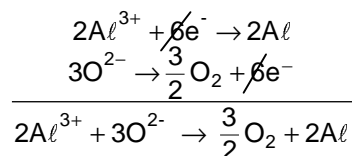
Fe₂O₃ hematita ou óxido de ferro (III)



Fe₃O₄ magnetita ou óxido duplo de ferro (II) e ferro (III)

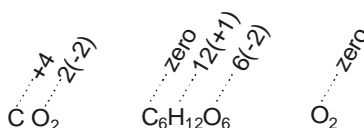


ou



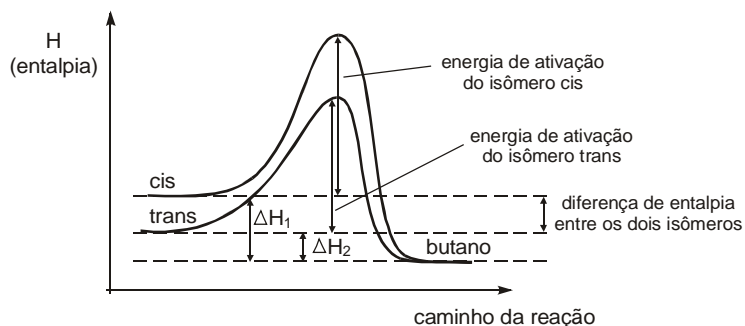


7. a. $6 \text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\ell) \rightarrow 6\text{O}_2(\text{g}) + \text{C}_6\text{H}_{12}\text{O}_6$
- b. Sim. O catalisador é a clorofila das plantas.
- c. A reação é endotérmica (absorve energia). Dá-se em presença da luz solar.
- d. $\frac{\text{volume O}_2}{\text{volume CO}_2} = \frac{6}{6} = 1$ (gases nas mesmas condições de P e T).
- e. nº de oxidação
Sofre oxidação o oxigênio: passa de -2 para zero.
Sofre redução o carbono: passa de +4 para zero.



O isômero cis é o de maior entalpia. A transformação do isômero cis em isômero trans libera 4 kJ/mol.

b. Diagrama energético das reações:



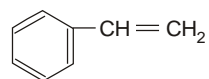


9. C_8H_8

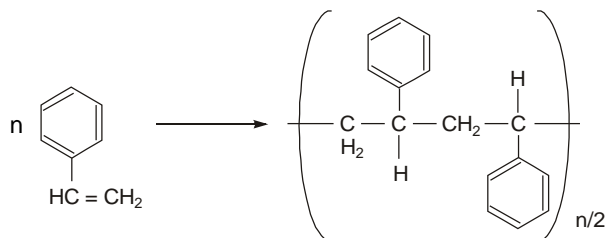
anel aromático



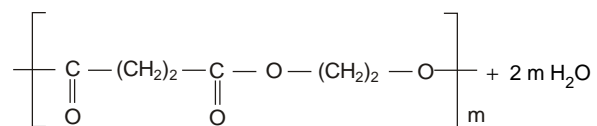
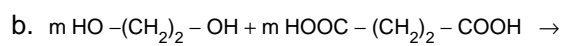
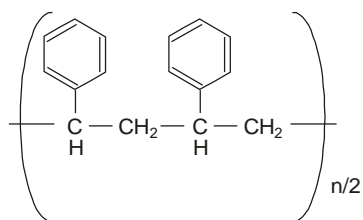
alceno $C = C$



estireno



ou

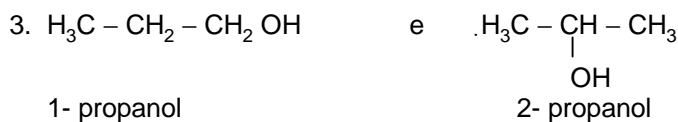
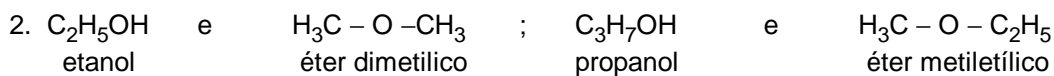
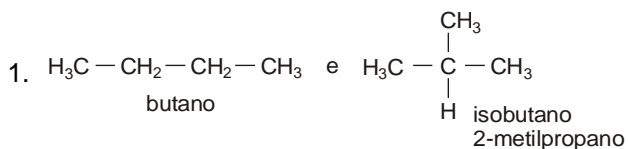




10. Exemplos de respostas possíveis:

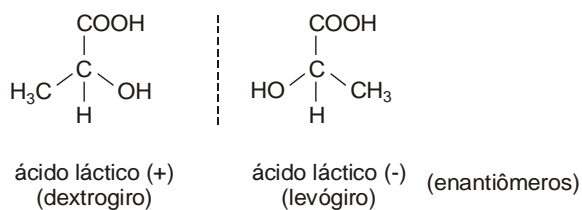
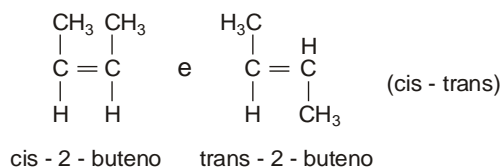
a.

I. Isômeros constitucionais



b.

II. Estereoisômeros



ou:

