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a) 7

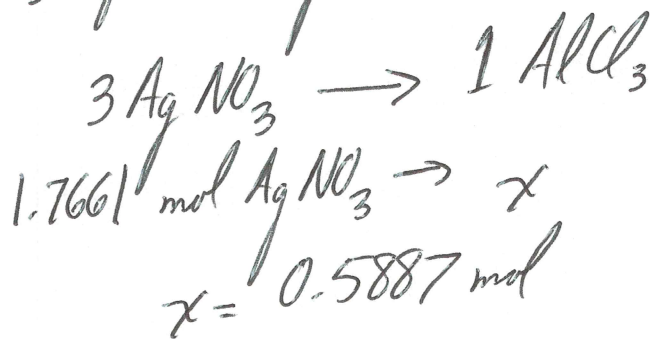
b) calculez le montant de AgCl qu'on peut produire assumant chaque réactif est limitant

$$\text{AgNO}_3: \frac{300.0}{169.87} = 1.7661 \xrightarrow{\times 3/3} 1.7661 \text{ mol AgCl}$$

$$\text{AlCl}_3: \frac{160.0}{133.34} = 1.1999 \xrightarrow{\times 3/1} 3.5997 \text{ mol AgCl}$$

$$\Rightarrow \text{AgNO}_3 \text{ limitant} \Rightarrow (1.7661)(143.32) = \underline{\underline{253.1 \text{ g de AgCl}}}$$

montant de AlCl_3 qui a réagi:



$$\begin{aligned} \text{AlCl}_3 (\text{excès}) &= \text{moles AlCl}_3 \text{ initial} - \text{moles AlCl}_3 \text{ qui a réagi} \\ &= 1.1999 - 0.5887 = 0.6112 \text{ mol} \end{aligned}$$

$$\Rightarrow \text{masse AlCl}_3 (\text{excès}) = (0.6112)(133.34) = \underline{\underline{81.5 \text{ g}}}$$

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a) 60%

$$b) C: \frac{35.29}{16.00} = 2.9384 / 1.6788 = 1.75 \times 4 = 7$$

$$O: \frac{33.58}{14.01} = 2.0988 / 1.6788 = 1.25 \times 4 = 5$$

$$N: \frac{23.52}{1.008} = 1.6788 / 1.6788 = 1.00 \times 4 = 4$$

$$H: \frac{7.62}{1.008} = 7.5595 / 1.6788 = 4.50 \times 4 = 18$$

⇒ Formule empirique = $C_7 O_5 N_4 H_{18}$

$$M = \frac{\rho RT}{P} = \frac{(11.21)(0.082056)(777)}{(1.000)} = 714.7 \text{ g/mol}$$

⇒ la masse molaire de $C_7 O_5 N_4 H_{18}$ est 238.3 g/mol

⇒ exactement 3 fois plus ^{petit} que 714.7 g/mol

⇒ formule moléculaire = $C_{21} O_{15} N_{12} H_{54}$

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a) IO_3^-

$$b) n_T = \frac{P_T V}{RT} = \frac{(3.333)(30.00)}{(0.082056)(298.15)} = 4.0871 \text{ mol}$$

$$n_T = n_{\text{CO}_2} + n_{\text{N}_2} + n_{\text{Cl}_2}$$

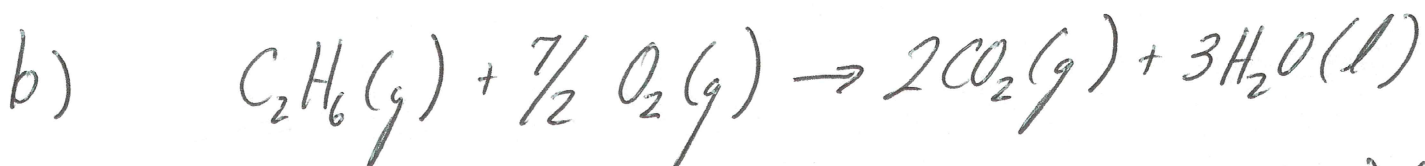
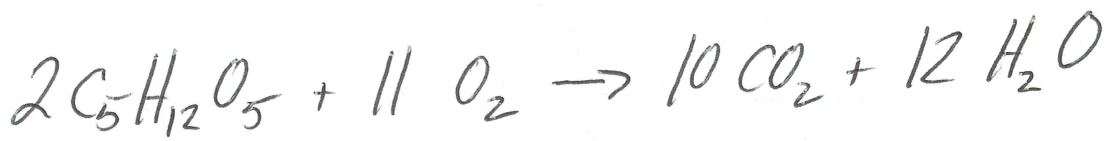
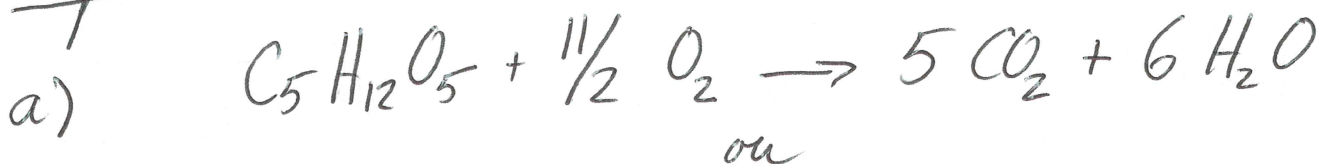
$$n_{\text{Cl}_2} = n_T - n_{\text{CO}_2} - n_{\text{N}_2}$$

$$n_{\text{Cl}_2} = 4.0871 - \frac{55.5}{44.01} - \frac{66.6}{28.02} = 0.4491 \text{ mol}$$

$$\text{masse Cl}_2 = (0.4491)(70.90) = \underline{\underline{31.8 \text{ g}}}$$

$$v = \sqrt{\frac{3RT}{M}} = \sqrt{\frac{(3)(8.3145)(298.15)}{(0.07090)}} = \underline{\underline{323.9 \text{ m/s}}}$$

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$$\Delta H = (2)(-393.5) + (3)(-285.8) - (1)(-83.8) - \left(\frac{7}{2}\right)(0)$$

$$\Delta H = \underline{\underline{-1560.6 \text{ kJ}}}$$

$$Q = \Delta H = \underline{\underline{-1560.6 \text{ kJ}}} \quad (P \text{ constante})$$

$$\Delta U = \Delta H - RT \Delta n_{\text{gaz}} = -1560600 - (8.3145)(298.15)\left(2 - \frac{9}{2}\right)$$

$$\Delta U = -1554403 \text{ J} = \underline{\underline{-1554.4 \text{ kJ}}}$$

$$\Delta U = Q + W \Rightarrow W = \Delta U - Q = -1554.4 - (-1560.6) = \underline{\underline{6.2 \text{ kJ}}}$$

$$\Rightarrow \text{à } V \text{ constant, } Q = \Delta U$$

$$\Rightarrow Q = (1.444)(-1554.4) = \underline{\underline{-6908 \text{ kJ}}}$$

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a) Millikan

$$b) -Q_M = Q_{\text{eau}} + Q_{\text{b\u00e9cher}}$$

$$-m_M s_M \Delta T_M = m_{\text{eau}} s_{\text{eau}} \Delta T_{\text{eau}} + C_{\text{b\u00e9cher}} \Delta T_{\text{b\u00e9cher}}$$

$$\Delta T_M = \frac{m_{\text{eau}} s_{\text{eau}} \Delta T_{\text{eau}} + C_{\text{b\u00e9cher}} \Delta T_{\text{b\u00e9cher}}}{-m_M s_M}$$

$$\Delta T_M = \frac{(333.3)(4.184)(2.00) + (1111)(2.00)}{-(100.0)(0.5555)} = -90.2$$

$$\Delta T = T_F - T_i \Rightarrow T_i = T_F - \Delta T = 22.00 - (-90.2) = \underline{\underline{112.2^\circ\text{C}}}$$

$$c) Q = +30.00 \text{ kJ \u00e0 } P \text{ constante} \Rightarrow \Delta H = \underline{\underline{+30.00 \text{ kJ}}}$$

$$\Delta U = \Delta H - RT \Delta n_{\text{gaz}}$$

$$\Delta U = 30000 - (8.3145)(298.15)(2-1) = 27521 \text{ J}$$

$$\Delta U = \underline{\underline{+27.52 \text{ kJ}}}$$

$$\text{\u00e0 } V \text{ constant : } W = \underline{\underline{0 \text{ kJ}}} ; Q = \Delta U = \underline{\underline{27.52 \text{ kJ}}}$$