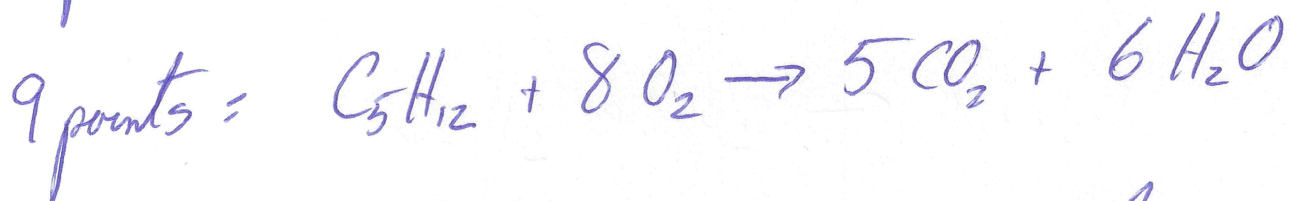


Page 1

1 point : 6



$$n_{C_5H_{12}} = \frac{m}{M} = \frac{88.8}{72.15} = 1.231 \text{ mol}$$

$$n_{O_2} = \frac{P_{O_2} V}{RT} = \frac{(7.77)(50.0)}{(0.082056)(298.15)} = 15.880 \text{ mol}$$

$$\Rightarrow \text{si } C_5H_{12} \text{ limitant} : n_{H_2O} = 1.231 \times \frac{6}{1} = 7.386 \text{ mol}$$

$$\Rightarrow \text{si } O_2 \text{ limitant} : n_{H_2O} = 15.880 \times \frac{6}{8} = 11.910 \text{ mol}$$

$\Rightarrow C_5H_{12}$ limitant

$$\Rightarrow \text{masse } H_2O = (7.386)(18.02) = \underline{\underline{133 \text{ g}}}$$

$$\Rightarrow \text{mol } O_2 \text{ qui réagissent avec } C_5H_{12} : n_{C_5H_{12}} \times \frac{8}{1}$$

$$n_{O_2}(\text{excès}) = n_{O_2}(\text{initial}) - n_{O_2}(\text{réagpt})$$

$$= 15.880 - \left(\frac{8}{1}\right)(1.231) = 6.032 \text{ mol}$$

$$\text{masse } O_2(\text{excès}) = (6.032)(32.00) = \underline{\underline{193 \text{ g}}}$$

Page 2

1 point = positive

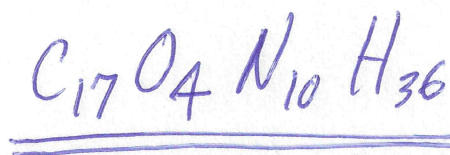
6 points:

$$C: \frac{45.93}{12.01} = 3.824 / 0.900 = 4.25 \times 4 = 17$$

$$O: \frac{14.40}{16.00} = 0.900 / 0.900 = 1 \times 4 = 4$$

$$N: \frac{31.57}{14.01} = 2.249 / 0.900 = 2.50 \times 4 = 10$$

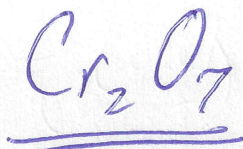
$$H: \frac{8.16}{1.008} = 8.095 / 0.900 = 9 \times 4 = 36$$



3 points:

$$Cr: \frac{48.15}{52.00} = 0.926 / 0.926 = 1 \times 2 = 2$$

$$O: \frac{57.85}{16.00} = \frac{3.616}{0.926} = 3.5 \times 2 = 7$$



Page 3

1 point: IO⁻

5 points =

$$n_T = \frac{P_T V}{RT} = \frac{(7.77)(20.0)}{(0.082056)(298.15)} = 6.3519$$

$$n_T = n_{CO_2} + n_{O_2} + n_X$$

$$n_X = n_T - n_{CO_2} - n_{O_2} = 6.3519 - \frac{99.9}{44.01} - \frac{66.6}{32.00} = 2.0007$$

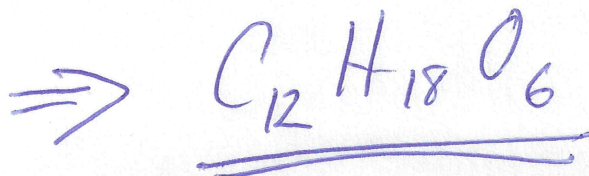
$$M = 88.8 / 2.0007 = \underline{\underline{44.4 \text{ g/mol}}}$$

4 points:

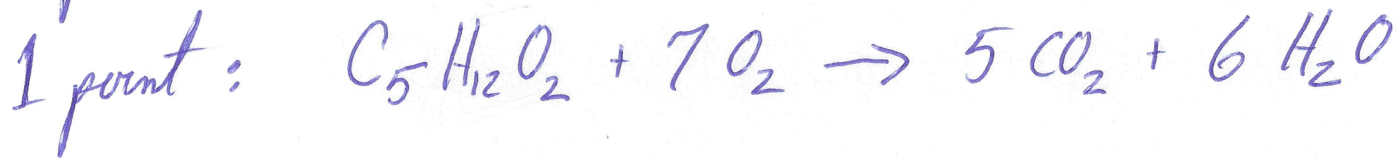
$$M = \frac{\rho RT}{P} = \frac{(3.54)(0.082056)(888)}{(1.00)} = 257.9 \text{ g/mol}$$

↖ x6

masse molaire de $C_2H_3O = 43.04 \text{ g/mol}$



Page A



9 points:



$$\Delta H = (3)(-393.5) + (4)(-285.8) - (1)(-103.9) - (5)(0)$$

$$\Delta H = -2219.8 \text{ kJ}$$

\Rightarrow pour chauffer l'eau, on a besoin

$$Q_{\text{eau}} = ms\Delta T = (5000)(4.184)(30.0) \\ = 627600 \text{ J} = 627.6 \text{ kJ}$$

$$\begin{array}{l} 1 \text{ mole } C_3H_8 \rightarrow 2219.8 \text{ kJ product} \\ x \rightarrow 627.6 \text{ kJ} \end{array}$$

$$\Rightarrow x = 0.2827 \text{ mol}$$

$$V = \frac{nRT}{P} = \frac{(0.2827)(0.082056)(298.15)}{(1.00)} = \underline{\underline{6.92 \text{ L}}}$$

Page 5

1 point: Chadwick

6 points: $-Q_M = Q_{\text{eau}} + Q_{\text{becher}}$

$$-m_M s_M (T_f - 10.00) = m_{\text{eau}} s_{\text{eau}} (T_f - 95.00) + C_{\text{becher}} (T_f - 95.00)$$

$$-(50.0)(0.777)(T_f - 10.00) = (333.3)(4.184)(T_f - 95.00) + (999)(T_f - 95.00)$$

$$-38.85 T_f + 388.5 = 1394.5 T_f - 132480.0 + 999 T_f - 94905$$

$$227773.5 = 2432.4 T_f$$

$$T_f = \frac{227773.5}{2432.4} = \underline{\underline{93.64^\circ\text{C}}} \text{ ou } \underline{\underline{93.6^\circ\text{C}}}$$

3 points:

