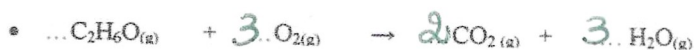
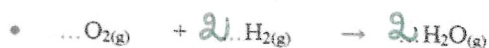
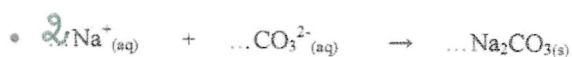
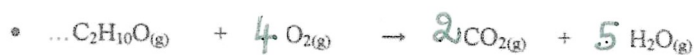
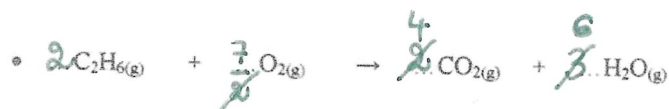
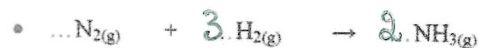
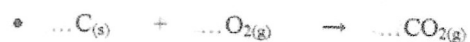


Exercice 1

Ajuster les nombres stoechiométriques dans les équations suivantes :



Exercice 2



$$\textcircled{1} \quad \frac{m(\text{Fe}^{3+})}{2} = \frac{m(\text{I}^-)}{2} \Rightarrow m(\text{Fe}^{3+}) = m(\text{I}^-) \Rightarrow \text{si } 4,2 \text{ mol Fe}^{3+} \text{ alors } 4,2 \text{ mol I}^-$$

$$\textcircled{2} \quad m(\text{I}_2) = \frac{m(\text{I}^-)}{2} = \frac{4,2}{2} = 2,1 \text{ mol} \quad \text{et} \quad m(\text{Fe}^{2+}) = m(\text{I}^-) = 4,2 \text{ mol}$$

Exercice 3

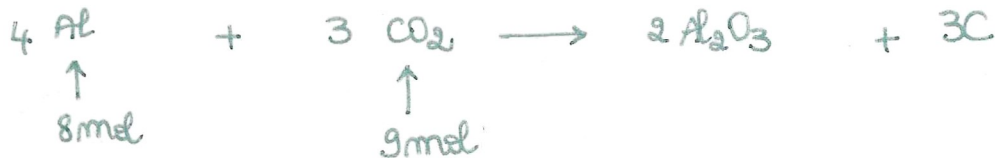


$$\textcircled{1} \quad \frac{m(\text{H}_2\text{S})}{2} = \frac{m(\text{SO}_2)}{1} = \frac{2,1}{2} = 1,05 \text{ mol}$$

$$\textcircled{2} \quad \frac{m(\text{S})}{3} = m(\text{SO}_2) \Rightarrow m(\text{S}) = 3 \times m(\text{SO}_2) = 3 \times 1,05 = 3,15 \text{ mol}$$

$$m(\text{H}_2\text{O}) = m(\text{H}_2\text{S}) = 2,1 \text{ mol}$$

Exercice 4



① réactifs = Al et CO₂

② produits = Al₂O₃ et C

$$\left. \begin{array}{l}
 \frac{n(\text{Al})}{4} = \frac{8}{4} = 2 \text{ mol} \\
 \frac{n(\text{CO}_2)}{3} = \frac{9}{3} = 3 \text{ mol}
 \end{array} \right\} \frac{n(\text{Al})}{4} \neq \frac{n(\text{CO}_2)}{3} \rightarrow \text{proportions non stœchio}$$

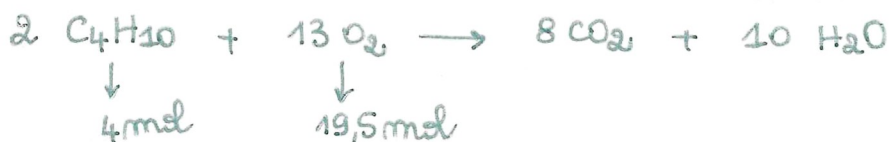
④ Réactif limitant

$$\frac{n(\text{Al})}{4} < \frac{n(\text{CO}_2)}{3}$$

↑

Al est le réactif limitant

Exercice 5



① réactifs = C₄H₁₀ et O₂

② produits = CO₂ et H₂O

$$\left. \begin{array}{l}
 \frac{n(\text{C}_4\text{H}_{10})}{2} = \frac{4}{2} = 2 \text{ mol} \\
 \frac{n(\text{O}_2)}{13} = \frac{19,5}{13} = 1,5 \text{ mol}
 \end{array} \right\} \frac{n(\text{C}_4\text{H}_{10})}{2} \neq \frac{n(\text{O}_2)}{13} \rightarrow \text{proportions non stœchio}$$

④ réactif limitant

$$\frac{n(\text{O}_2)}{13} < \frac{n(\text{C}_4\text{H}_{10})}{2} \rightarrow \text{O}_2 \text{ est le réactif limitant}$$

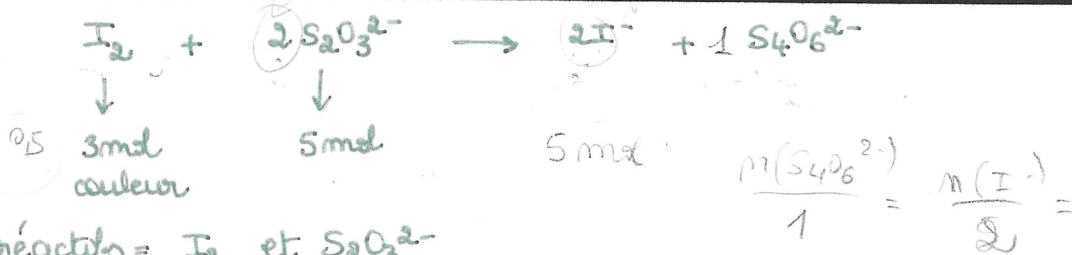
3

5

1

2

Exercice 6

① réactifs = I_2 et $\text{S}_2\text{O}_3^{2-}$ ② produits = I^- et $\text{S}_4\text{O}_6^{2-}$

$$\left. \begin{array}{l}
 \frac{n(\text{I}_2)}{1} = \frac{3}{1} = 3\text{mmol} \\
 \frac{n(\text{S}_2\text{O}_3^{2-})}{2} = \frac{5}{2} = 2,5\text{mmol}
 \end{array} \right\} \frac{n(\text{I}_2)}{1} \neq \frac{n(\text{S}_2\text{O}_3^{2-})}{2} \rightarrow \text{proportions non stoechi}$$

$$\textcircled{4} \frac{n(\text{S}_2\text{O}_3^{2-})}{2} < \frac{n(\text{I}_2)}{1} \Rightarrow \text{S}_2\text{O}_3^{2-} \text{ limitant}$$

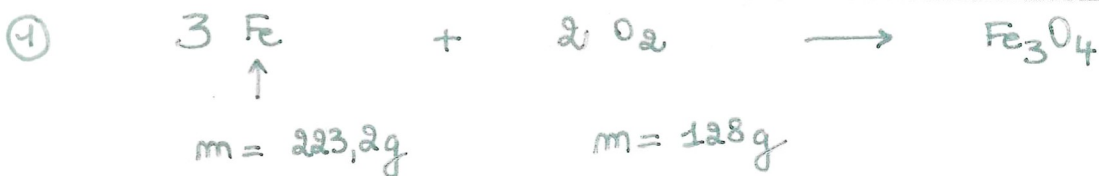
$$\begin{array}{l}
 \textcircled{5} m_f(\text{I}_2) = 3 - 2,5 = 0,5\text{mmol} \\
 m_f(\text{S}_2\text{O}_3^{2-}) = 5 - 2 \times 2,5 = 0\text{mmol} \text{ (limitant)} \\
 m_f(\text{I}^-) = 5\text{mmol} \\
 m_f(\text{S}_4\text{O}_6^{2-}) = 2,5\text{mmol}
 \end{array}$$

⑥ mélange coloré car il reste 0,5 mmol de I_2

$$\begin{array}{l}
 \textcircled{7} [\text{I}^-] = \frac{n(\text{I}^-)}{V_{\text{sol}}} \\
 = \frac{5}{50 \times 10^{-3}} \\
 = 100 \text{ mol} \cdot \text{L}^{-1}
 \end{array}$$

$$c = \frac{n}{V} = \frac{5}{0,05} = 100$$

Exercice 7



$$\left. \begin{array}{l}
 \textcircled{2} \quad m(\text{Fe}) = \frac{m(\text{Fe})}{M(\text{Fe})} = \frac{223,2}{55,8} = 4\text{mmol} \\
 m(\text{O}_2) = \frac{m(\text{O}_2)}{M(\text{O}_2)} = \frac{128}{2 \times 16} = 4\text{mmol}
 \end{array} \right\} \left. \begin{array}{l}
 \frac{m(\text{Fe})}{3} = \frac{4}{3} = 1,3\text{mmol} \\
 \frac{m(\text{O}_2)}{2} = \frac{4}{2} = 2\text{mmol}
 \end{array} \right\} \frac{m(\text{Fe})}{3} \neq \frac{m(\text{O}_2)}{2} \rightarrow \text{non stoechi}$$

$$\textcircled{3} \frac{m(\text{Fe})}{3} < \frac{m(\text{O}_2)}{2} \rightarrow \text{Fe réactif limitant}$$

$$\begin{array}{l}
 \textcircled{4} \quad m_f(\text{Fe}) = 0\text{mmol} \text{ (limitant)} \\
 m_f(\text{O}_2) = 4 - 2 \times 1,3 = 1,4\text{mmol} \\
 m_f(\text{Fe}_3\text{O}_4) = 1,3\text{mmol}
 \end{array}$$

$$\textcircled{5} \quad m(\text{O}_2) = n(\text{O}_2) \times M(\text{O}_2) = 1,4 \times 2 \times 16 = 44,8\text{g}$$

$$m(\text{Fe}_3\text{O}_4) = n(\text{Fe}_3\text{O}_4) \times M(\text{Fe}_3\text{O}_4) = 1,3 \times (3 \times 55,8 + 4 \times 16) = 300,82\text{g}$$

Exercice 8



② si tout le butane a brûlé c'est lui le réactif limitant

$$n(\text{C}_4\text{H}_{10}) = \frac{m(\text{C}_4\text{H}_{10})}{M(\text{C}_4\text{H}_{10})} = \frac{227}{4 \times 12 + 10} = 3,91 \text{ mol}$$

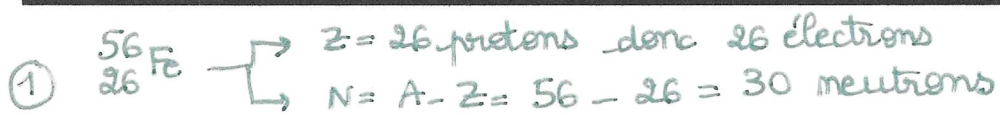
$$n_f(\text{C}_4\text{H}_{10}) = 0 \text{ mol}$$

$$\frac{n_f(\text{O}_2)}{13} = \frac{n(\text{C}_4\text{H}_{10})}{2} \rightarrow n_f(\text{O}_2) = \frac{13}{2} \times n(\text{C}_4\text{H}_{10}) = \frac{13 \times 3,91}{2} = 25,4 \text{ mol}$$

$$\frac{n_f(\text{H}_2\text{O})}{10} = \frac{n(\text{C}_4\text{H}_{10})}{2} \rightarrow n_f(\text{H}_2\text{O}) = \frac{10}{2} \times n(\text{C}_4\text{H}_{10}) = \frac{10 \times 3,91}{2} = 19,55 \text{ mol}$$

$$\rightarrow n_f(\text{CO}_2) = \frac{8}{2} \times n(\text{C}_4\text{H}_{10}) = \frac{8 \times 3,91}{2} = 15,64 \text{ mol}$$

Exercice 9



② Fe perd 2 électrons pour donner Fe^{2+}



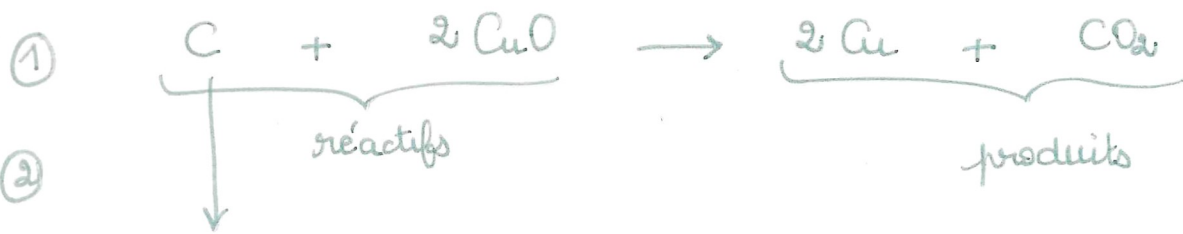
$$\textcircled{4} \quad n(\text{Fe}) = \frac{m(\text{Fe})}{M(\text{Fe})} = \frac{32}{56} = 0,57 \text{ mol}$$

$$\textcircled{5} \quad n(\text{H}_2) = n(\text{Fe}) = 0,57 \text{ mol}$$

⑥ volume molaire : $1 \text{ mol} \rightarrow 24 \text{ L}$
 $0,57 \text{ mol} \rightarrow V = ?$

$$\begin{aligned} V(\text{H}_2) &= n(\text{H}_2) \times V_m \\ &= 0,57 \times 24 \\ &= 13,68 \text{ L} \end{aligned}$$

Exercice 10



③ $m = 48\text{g}$

a)
$$m(\text{C}) = \frac{m(\text{C})}{M(\text{C})} = \frac{18}{12} = 1,5\text{mol}$$

b)
$$\frac{m(\text{CuO})}{2} = \frac{m(\text{C})}{1} \rightarrow m(\text{CuO}) = 2 \times m(\text{C})$$

$$= 2 \times 1,5$$

$$= 3\text{mol}$$

c) $m(\text{Cu}) = m(\text{CuO}) = 3\text{mol}$

d)
$$m(\text{Cu}) = m(\text{Cu}) \times M(\text{Cu})$$

$$= 3 \times 64$$

$$= 192\text{g}$$