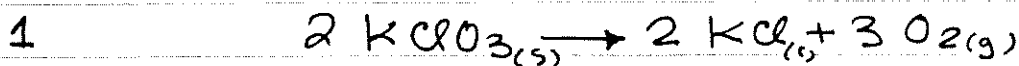


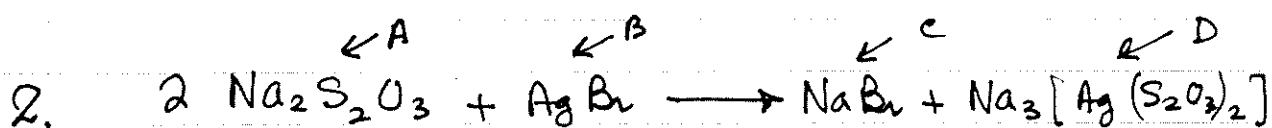
STOICHIOMETRY



(a) $3.00 \text{ g KClO}_3 \times \frac{1 \text{ mol KClO}_3}{122.6 \text{ g KClO}_3} \times \frac{3 \text{ mol O}_2}{2 \text{ mol KClO}_3} \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 1.17$

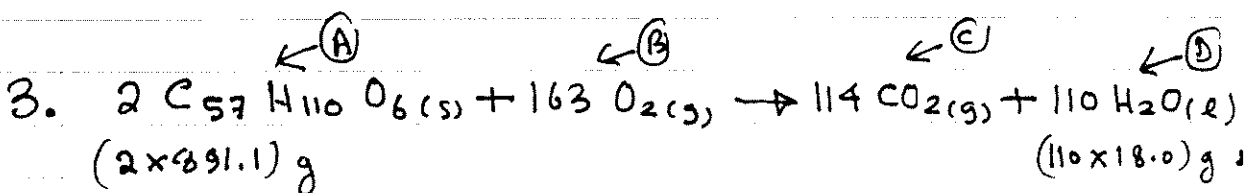
(b) $6.00 \text{ g O}_2 \times \frac{2 \times 74.6 \text{ g KCl}}{3 \times 32.0 \text{ g O}_2} = 9.33 \text{ g KCl}$

(c) $16.0 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \times \frac{2 \text{ mol KClO}_3}{3 \text{ mol O}_2} \times \frac{122.6 \text{ g KClO}_3}{1 \text{ mol KClO}_3} = 40.9$



(a) $1.0 \times 10^{-3} \text{ g } \textcircled{\text{B}} \times \frac{1 \text{ mol } \textcircled{\text{B}}}{187.8 \text{ g } \textcircled{\text{B}}} \times \frac{2 \text{ mol } \textcircled{\text{A}}}{1 \text{ mol } \textcircled{\text{B}}} \times \frac{158.2 \text{ g } \textcircled{\text{A}}}{1 \text{ mol } \textcircled{\text{A}}} = 1.68 \times 10^{-3} \text{ g}$

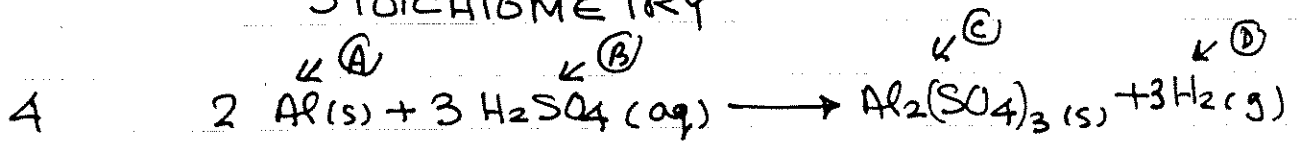
(b) $1.00 \text{ g } \textcircled{\text{D}} \times \frac{1 \text{ mol } \textcircled{\text{D}}}{401.3 \text{ g } \textcircled{\text{D}}} \times \frac{1 \text{ mol } \textcircled{\text{B}}}{1 \text{ mol } \textcircled{\text{D}}} \times \frac{187.8 \text{ g } \textcircled{\text{B}}}{1 \text{ mol } \textcircled{\text{B}}} = 0.468 \text{ g}$



(a) $2.5 \times 10^3 \text{ g } \textcircled{\text{A}} \times \frac{(110 \times 18.0) \text{ g } \textcircled{\text{D}}}{(2 \times 891.1) \text{ g } \textcircled{\text{A}}} = 2.777 \times 10^3 \text{ g H}_2\text{O}$

(b) $2.5 \text{ g } \textcircled{\text{A}} \times \frac{(163 \times 32.0) \text{ g } \textcircled{\text{B}}}{(2 \times 891.1) \text{ g } \textcircled{\text{A}}} = 7.32 \text{ g O}_2$

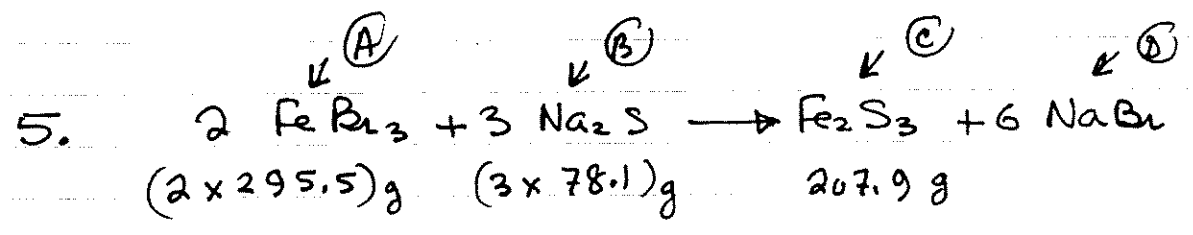
STOICHIOMETRY



$$50.0 \text{ g } \textcircled{A} \times \frac{1 \text{ mol } \textcircled{A}}{2.00 \text{ g } \textcircled{A}} \times \frac{3 \text{ mol } \textcircled{B}}{3 \text{ mol } \textcircled{A}} \times \frac{98.1 \text{ g } \textcircled{B}}{1 \text{ mol } \textcircled{B}} = \underline{\underline{2.45 \times 10^3 \text{ g } \textcircled{B}}}$$

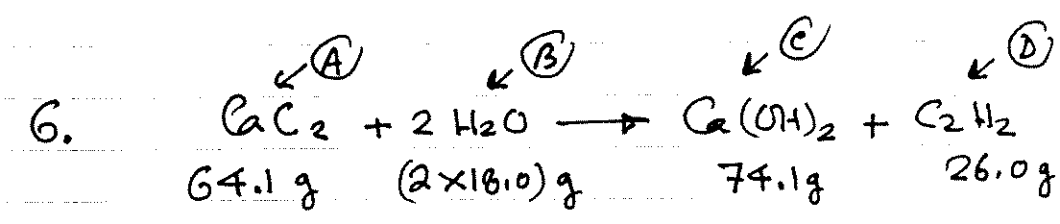
$$2.45 \times 10^3 \text{ g } \textcircled{B} \times \frac{100 \text{ g ACID}}{55.1 \text{ g } \textcircled{B}} = \underline{\underline{4447 \text{ g COMMERCIAL ACID}}}$$

$$4447 \text{ g COMM ACID} \times \frac{1 \text{ mL COMM ACID}}{1.45 \text{ g COMM ACID}} = \underline{\underline{3067 \text{ mL ACID}}} = \underline{\underline{3.07 \text{ L ACID}}}$$



$$3.50 \text{ g } \textcircled{A} \times \frac{207.9 \text{ g } \textcircled{C}}{(2 \times 295.5) \text{ g } \textcircled{A}} = \underline{\underline{1.23 \text{ g Fe}_2\text{S}_3}} \leftarrow \text{ANSWER}$$

$$6.4 \text{ g } \textcircled{B} \times \frac{207.9 \text{ g } \textcircled{C}}{(3 \times 78.1) \text{ g } \textcircled{B}} = 5.68 \text{ g Fe}_2\text{S}_3$$



$$\text{(a)} \quad 100 \text{ g } \textcircled{A} \times \frac{26.0 \text{ g } \textcircled{D}}{64.1 \text{ g } \textcircled{A}} = 40.6 \text{ g } \textcircled{D}$$

$$100 \text{ g } \textcircled{B} \times \frac{26.0 \text{ g } \textcircled{D}}{(2 \times 18.0) \text{ g } \textcircled{B}} = 72.2 \text{ g } \textcircled{D}$$

ANSWER: CaCl_2 is LR b/c it produces

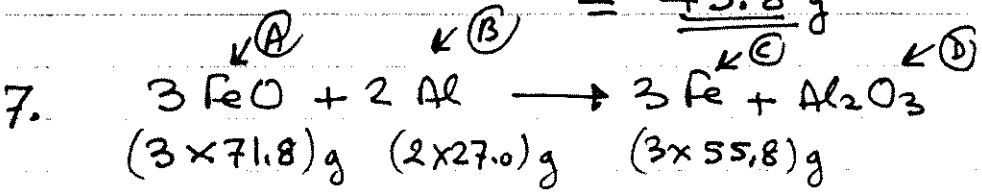
STOICHIOMETRY

6. (b) 40.6 g C₂H₂ produced.

$$(c) 100 \text{ g CaCl}_2 \times \frac{1 \text{ mol CaCl}_2}{64.1 \text{ g CaCl}_2} \times \frac{2 \text{ mol H}_2\text{O}}{1 \text{ mol CaCl}_2} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 56.2 \text{ g H}_2\text{O used}$$

H₂O REMAINING = 100 (given) - 56.2 (used)

$$= \underline{43.8 \text{ g}}$$

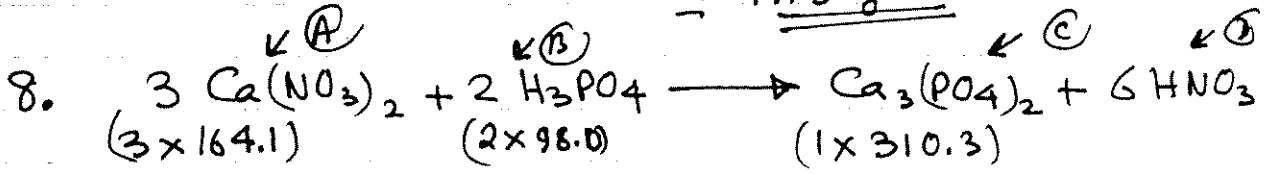


$$(a) 7.45 \text{ g } \textcircled{A} \times \frac{(2 \times 27.0) \text{ g } \textcircled{B}}{(3 \times 71.8) \text{ g } \textcircled{A}} = 1.87 \text{ g Al needed.}$$

We are given more Al than we need, so Al is excess reactant and FeO is limiting reactant

$$(b) 7.45 \text{ g } \textcircled{A} \times \frac{(3 \times 55.8) \text{ g } \textcircled{C}}{(3 \times 71.8) \text{ g } \textcircled{A}} = \underline{5.79 \text{ g Fe}}$$

$$(c) \text{ Excess reactant is Al} = 3.00 \text{ (given)} - 1.87 \text{ (needed)} = \underline{1.13 \text{ g Al}}$$



$$206 \text{ g } \textcircled{A} \times \frac{(1 \times 310.3) \text{ g } \textcircled{C}}{(3 \times 164.1) \text{ g } \textcircled{A}} = \underline{130 \text{ g } \textcircled{C}}$$

$$150 \text{ g } \textcircled{B} \times \frac{(1 \times 310.3) \text{ g } \textcircled{C}}{(2 \times 98.0) \text{ g } \textcircled{B}} = 237 \text{ g } \textcircled{C}$$