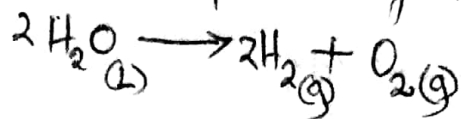


1. Decomposition of water



moles of water = 0.033 moles.

mole ratio of  $\text{H}_2\text{O} : \text{O}_2$

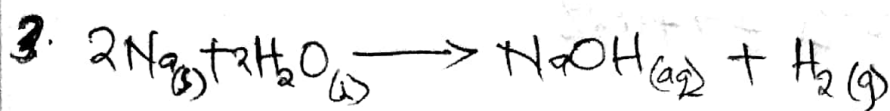
2 : 1

0.033 → ?

$$\left( \frac{0.033 \times 1}{2} \right) \text{ moles.}$$

moles of  $\text{O}_2 = 0.0165$  moles.

$$\begin{aligned} \text{grams of oxygen produced} &= (0.0165 \text{ moles} \times 18 \text{ g/mole}) \\ &= \underline{\underline{0.297 \text{ g of } \text{O}_2 \text{ produced}}} \end{aligned}$$



$$\text{moles of Na} = \frac{20.0 \text{ g}}{23 \text{ g/mole}} = 0.87 \text{ moles of Na.}$$

mole ratio  $\text{NaOH} : \text{Na}$

1 : 2

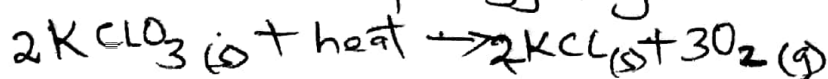
X 0.87

$$\left( \frac{0.87 \times 1}{2} \right) \text{ moles}$$

moles of  $\text{NaOH} = 0.435$  moles

$$\begin{aligned} \text{mass of NaOH} &= (0.435 \text{ moles} \times 40 \text{ g/mole}) \\ &= \underline{\underline{17.4 \text{ g of NaOH produced}}} \end{aligned}$$

2. Preparation of Oxygen gas.



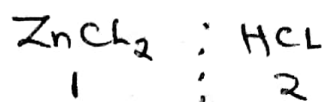
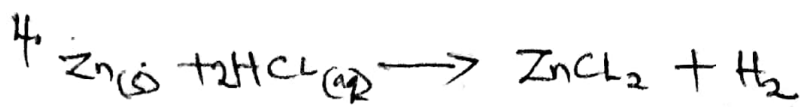
mole ratio of  $\text{KClO}_3 : \text{O}_2$

2 : 3

moles of  $\text{KClO}_3 = 3.0$  moles

$$\text{moles of } \text{O}_2 = \left( \frac{3 \text{ moles} \times 3}{2} \right) = 4.5 \text{ moles.}$$

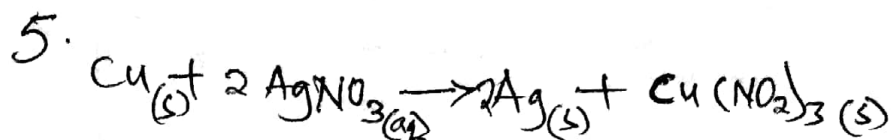
moles of  $\text{O}_2$  formed = 4.5 moles.



7.50 moles

$$\text{moles of HCl} = \left( \frac{7.50 \text{ moles} \times 2}{1} \right) = 15 \text{ moles of HCl.}$$

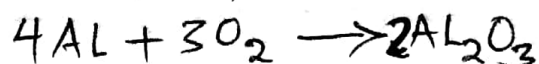
$$\text{moles of HCl} = \underline{\underline{15 \text{ moles}}}$$



$$\text{moles of Ag} = \left( \frac{250 \text{ g}}{108 \text{ g/mole}} \right)$$

$$\text{mole ratio of Ag : Cu} \\ 2 : 1$$

6. Burning of Aluminium in excess oxygen.

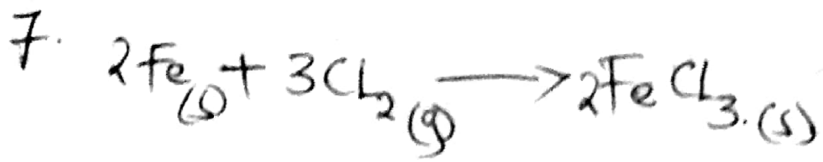


$$\text{mass} = \text{Al}_2\text{O}_3 = 0.75 \text{ moles}$$

$$\text{mole ratio of } \text{O}_2 : \text{Al}_2\text{O}_3 = 3 : 2$$

$$\begin{aligned} \text{moles of } \text{O}_2 &= \left( \frac{3 \times 0.75 \text{ moles}}{2} \right) = 1.125 \text{ moles of } \text{O}_2 \end{aligned}$$

$$\begin{aligned} \text{mass of } \text{O}_2 &= (1.125 \text{ moles} \times 32 \text{ g/mol}) \\ &= \underline{\underline{20.25 \text{ g of Oxygen}}} \end{aligned}$$



$$\frac{31\text{L Cl}_2}{1} \times \frac{1\text{mole Cl}_2}{22.4\text{L Cl}_2} = 1.384\text{ moles Cl}_2$$

$$\begin{aligned} \text{mass of Cl}_2 &= (1.384\text{ moles} \times 35.5\text{g/mole}) \\ &= 49.132\text{g of Cl}_2 \end{aligned}$$