

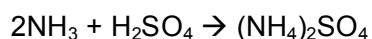
## REVIEW EXERCISE 1

- 1) Determine the number of moles of magnesium oxide produced when 2 moles oxygen is reacted as in the equation:  
 $2 \text{Mg} + \text{O}_2 \Rightarrow 2\text{MgO}$
- 2) Mercuric oxide when heated produces mercury and oxygen according to:  $2\text{HgO} \Rightarrow 2\text{Hg} + \text{O}_2$   
  
If 0.4 mole mercuric oxide is decomposed, how many moles of  
a) Mercury b) oxygen are produced?
- 3) Find the number of moles of hydrochloric acid required to react with 0.1 mole zinc metal:  
 $\text{Zn} + 2\text{HCl} \Rightarrow \text{ZnCl}_2 + \text{H}_2$
- 4) Find a) the number of moles of calcium oxide  
b) the number of moles of carbon dioxide produced when 0.30 mole calcium carbonate is decomposed by strong heating according to:  $\text{CaCO}_3 \Rightarrow \text{CaO} + \text{CO}_2$
- 5) 1.5 moles potassium nitrate are heated:  
 $2\text{KNO}_3 \Rightarrow 2\text{KNO}_2 + \text{O}_2$   
How many moles of  
a) potassium nitrate is formed and  
b) Oxygen is evolved?
- 6) The electrolysis of water can be represented by the equation:  
 $2\text{H}_2\text{O} \Rightarrow 2\text{H}_2 + \text{O}_2$   
If 0.5 mole oxygen has been produced determine the moles of water electrolysed
- 7) How many moles of sodium carbonate, when reacted with excess sulphuric acid, will produce 0.22 mole carbon dioxide?
- 8)  
 $\text{Na}_2\text{CO}_3 + \text{H}_2\text{SO}_4 \Rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- 9) A piece of copper, when placed in a silver nitrate solution, deposits silver from the solution:  
 $\text{Cu} + 2\text{AgNO}_3 \Rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$   
Determine the moles of copper consumed if 0.04 mole silver is deposited.
- 10) Sodium when added to water reacts rapidly:  
 $2\text{Na} + 2\text{H}_2\text{O} \Rightarrow 2\text{NaOH} + \text{H}_2$   
If 0.1 mole hydrogen gas is evolved, determine the moles of sodium metal used.
- 11) Aluminium burns according to:  
 $4\text{Al} + 3\text{O}_2 \Rightarrow 2\text{Al}_2\text{O}_3$   
If 0.2 mole aluminium oxide is produced, how many moles of aluminium was burnt?

## SECTION TWO

### Mole to Mass Calculations

1. What mass of magnesium must be added to an excess of hydrochloric acid to liberate 0.2 mole of hydrogen gas?
2. Determine the mass of a) ammonia and b) sulphuric acid required to produce 2 moles of ammonium sulphate.



3. How many grams of manganese dioxide is required to produce 0.1 moles of chlorine gas on reaction with concentrated hydrochloric acid?



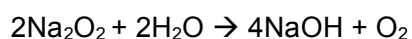
4. 0.05 mole of copper II oxide remains when a sampler of copper II carbonate is heated.



Determine the mass of

- a) copper II carbonate required
- b) carbon dioxide produced

5. 0.2 mole of oxygen is liberated when water is added to sodium peroxide



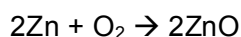
Determine

- a) the mass of sodium peroxide used and
- b) the number of moles of sodium hydroxide remaining in the solution.

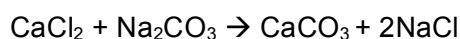
### SECTION THREE

#### **Mass to Mole calculations**

1. Determine the number of moles of zinc oxide produced when 13.08g of zinc is heated in sufficient oxygen



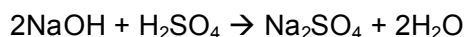
2. How many moles of calcium carbonate will be deposited when 53 g of sodium carbonate is added to a solution of calcium chloride?



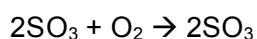
3. Find the number of moles of
  - a) ammonia and
  - b) carbon dioxide produced when 4.8 g ammonium carbonate is decomposed



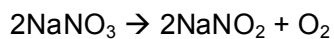
4. Calculate the number of moles of sulphuric acid required to neutralise 32g of sodium hydroxide



5. Determine the number of moles of sulphur trioxide formed when 16g of sulphur dioxide is oxidised

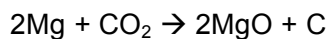


6. a) how many moles of sodium nitrate must be heated to produce 4g of oxygen?



c) How many moles of sodium nitrite will remain?

7. 3g of carbon is produced when magnesium is burnt in carbon dioxide



How many moles of magnesium is required?

8. Determine the number of moles of water which must be electrolysed to produce 128g of oxygen gas.

