

Structure {Paper02}

[MRSM10-04c]

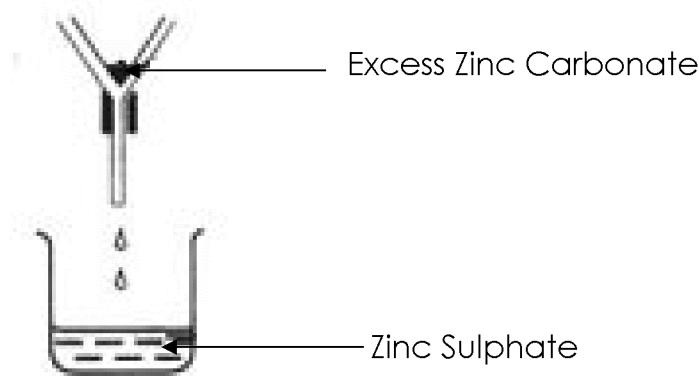
- C. (i) N : Zinc chloride
S : Sodium carbonate

(ii) Double decomposition // Precipitation reaction

[MRSM08-03]

(a) an ionic compound formed when the **hydrogen ion, H⁺ from an acid is replaced** by a **metal ion** or an **ammonium ion, NH₄⁺**

(b) (i)



(ii) To remove excess zinc carbonate // to get pure of zinc sulphate

(c)(i) Sulphuric acid

(ii) $\text{ZnCO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{CO}_2 + \text{H}_2\text{O}$
Formula of reactant and product correct [1]
equation is balance [2]

(d)(i) Magnesium// Aluminium

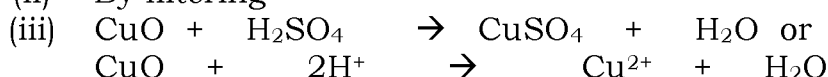
(ii) White precipitate formed [1]
then dissolved in excess ammonia aqueous [2]

[SPM04-05]

(a) From pink to colourless or intensity of the pink colour decreases or the container of the mixture becomes warm or hot

(b) (i) To ensure all the acid react completely with copper(II) oxide

(ii) By filtering



$$\begin{aligned} \text{(iv)} \quad n(\text{H}_2\text{SO}_4) &= 0.1 \times 50/1000 \\ &= 0.005 \end{aligned}$$

$$\begin{aligned} \text{Mass of Cu SO}_4 &= 0.005 \times 160 \\ &= 8.0 \text{ g} \end{aligned}$$

(c) 20.0 cm³ or twice the volume of sulphuric acid

(d)

Experiment I	Experiment II
<ul style="list-style-type: none"> • No needs filtering • a mixture between two solutions • need to add an indicator • experiment is repeated without using an indicator • volume of sulphuric acid is added accurately 	<ul style="list-style-type: none"> • need filtering • a mixture between a solid and solution • no need to add an indicator • no need to repeat the experiment • solute or CuO is added in excess

[SBPtrial09-04]

- (a) (i) Neutralization 1
- (ii) $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ 1
- (iii) Pink turns colourless 1
- (iv) $\frac{MaVa}{MbVb} = \frac{1}{1}, \frac{0.1 \times Va}{0.2 \times Vb} = \frac{1}{1}, V_a = 50 \text{ cm}^3$ 1+1
- (b) (i) Double decomposition/ Precipitate reaction 1
- (ii) Lead(II) iodide 1
- (iii) $\text{Pb}^{2+} + 2\text{I}^- \rightarrow \text{PbI}_2$ 1
- (c) Number of moles of $\text{Pb}(\text{NO}_3)_2 = \frac{1.0 \times 10}{1000} = 0.01$ 1
- Mass of $\text{PbI}_2 = 0.01 \times 461 = 4.61 \text{ g}$ 1

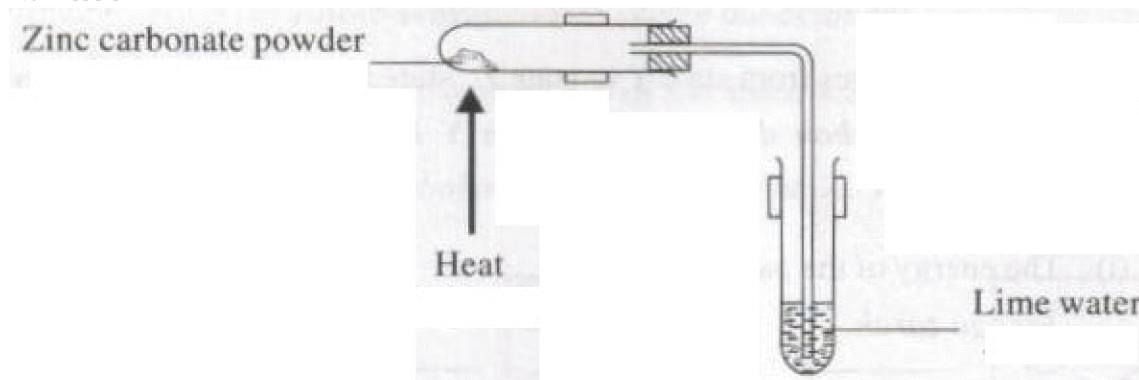
[SBPTrial10-04]

(a) Zinc sulphate / nitrate and sodium / potassium / ammonium carbonate // carbonic acid

(b) (i) Zinc oxide

(ii) 1. Functional diagram

2. Label



(c) (i) $\text{ZnO} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{O}$

(ii) 1. Heat the solution until saturated.

2. Cool the saturated solution.

3. Filter and dry by pressing between two filter papers

[SPM10-02]

a. carbon dioxide. R : formula

b.

Hot	Cool
Yellow	White

c. $\text{ZnCO}_3 \rightarrow \text{ZnO} + \text{CO}_2$

d. number of mole = $12.5/125 // 0.1$ [1]

volume of gas = $0.1 \times 24 / 2.4 \text{ dm}^3 // 2400 \text{ cm}^3$ [2]

e. (i) HCl // hydrochloric acid

(ii) 3 mole // 1 mole of zinc and 2 moles of chloride ions

(iii) Zinc ion // Zn^{2+} // hydrogen ion // H^+

[SBPmidyearF507-05]

- (a)(i) Oxygen
 (ii) Nitrogen dioxide
 (iii) Lead (II) oxide [remember – salt no need hydrogen ion]
 Reject / wrong : symbol
- (b) Put a glowing wooden splinter into the test tube.
 The glowing wooden splinter is lighted up
- (c)(i) Lead (II) ion // lead
- (ii) $\text{Pb}^{2+} + 2\text{OH}^- \rightarrow \text{Pb}(\text{OH})_2$
- (iii) Lead(II) hydroxide
- (d) (i) Yellow precipitate is formed
- (ii) Double decomposition reaction/precipitation

[SBPdiag07-06]

- (a) Pb^{2+} , Al^{3+} , Zn^{2+} {any two correct} 1+1
- (b) 1. Lead(II) nitrate
 2. $\text{Pb}(\text{NO}_3)_2$
- (c) (i) Precipitation / Double decomposition
 (ii) $\text{Pb}^{2+} + \text{SO}_4^{2-} \rightarrow \text{PbSO}_4$
- (d) 1. Add a few drops of potassium iodide solution
 2. Yellow precipitate formed
- (e) 1. Filter the mixture.
 2. Dry the precipitate between sheets of filter paper.

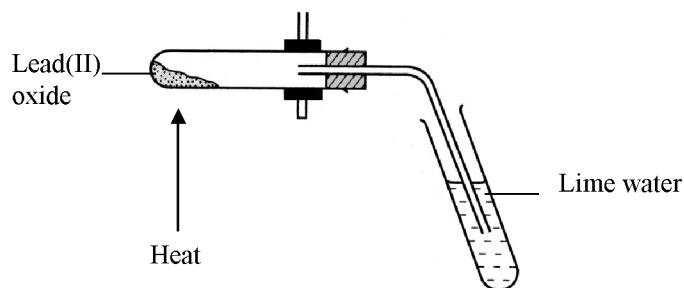
[SBPtrial05-03]

- (a) (i) Gas K : nitrogen dioksida
 (ii).Gas L : oksigen
- (b) Pb^{2+} , Al^{3+} , Zn^{2+}
- (c) Ion Plumbum(II)
- (d) Pepejal M berubah warna dari perang semasa panas menjadi kuning apabila sejuk.
- (e) $\text{Pb}^{2+} + \text{SO}_4^{2-} \longrightarrow \text{PbSO}_4$
- (f) Plumbum(II) nitrat
- (g) (i) $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$
 (ii). 1. masukkan kayu uji berbara ke dalam tabung uji
 2. kayu uji akan menyala

[SBPtrial08-03]

(a)(i) Lead(II) oxide

(ii)



1. Diagram of set up of apparatus complete and functional
2. Label



(iii)

$$1. \text{ Mole of PbCO}_3 = \frac{13.35}{267}$$

(iv)

$$= 0.05$$

$$2. \text{ Volume of CO}_2 = (0.05)(24) \\ = 1.2 \text{ dm}^3 \text{ or } 1200 \text{ cm}^3$$

(c)(i) Lead(II) iodide

(ii) Yellow

(iii) $\text{Pb}^{2+} + 2\text{I}^- \rightarrow 2\text{PbI}_2$

(iv) Filter the mixture

[MRSM09-05]

(a) (i) Bubbles gas released

(ii) Copper(II) salt : Copper(II) sulphate
Gas E : Carbon dioxide

(b) (i) Double decomposition reaction

(iii) Mol, $n = MV/1000$, di mana mol = 0.02 (dlm soalan) , Molarity, $M = 0.5$

$$V = \text{mol} \times \frac{1000}{M} \\ = 0.02 \times \frac{1000}{0.5} \\ = 40 \text{ cm}^3 \text{ [sbb kita bahagi dgn seribu]}$$

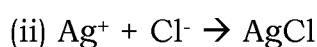
(c) Zinc is more electropositive than Copper in Electrochemical series
Then Zinc can displace Copper from copper(II) salt solution

(d) Blue precipitate formed[M1]
Then soluble in excess aqueous ammonia[M2]

[MRSM07-03]

(a) (i)

Test	Inference
1	Gas releases has properties of alkali
2	Solution contains nitrate ions, NO ₃ ⁻ because formation of brown ring
3	Solution contains silver ions because white precipitate formed is silver chloride, AgCl



(b) (i) Zinc // Zinc oxide // Zinc Carbonate



(iii) 1. Mol sulphuric acid = $\text{MV}/1000$
= $0.2 \times 50/1000$
= 0.01 mol

2. Ratio of sulphuric acid to ZnSO₄
1 mol : 1 mol
0.01 mol : 0.01 mol

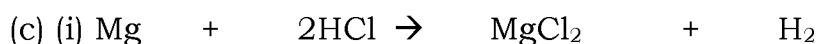
3. mass of ZnSO₄ = mol X molar mass
= 0.01 X 161
= 1.61 g

[MRSM04-04]

(a) Solution E : magnesium chloride
Substance G : lead(II) chloride

(b) 1. Collect gas R used test tube, then place the light-up splinter near the mouth of test tube

2. 'pop' sound produce. Gas R is a hydrogen gas

(ii) Number of mole HCl = $\text{MV}/100 = 1.0 \times 20 / 1000 = 0.02$ mole

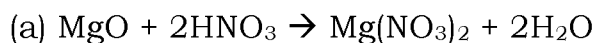
2 mole HCl produce 1 mole H₂
0.02 mole HCl produce 0.01 mole H₂

Volume of gas R = mole X molar volume room condition = $0.01 \times 24 = 0.24 \text{ dm}^3$

(d) (i) Double decomposition reaction // precipitate reaction

(ii) filter the mixture, the residue is substance G. Dry using filter paper.

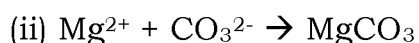
[MRSM03-03]



(b) 1. Add MgO into 100 cm³ of 0.1 mol dm⁻³ nitric acid in the 200 cm³ of beaker while heating until excess

2. Filter the mixture. The filtrate is ZnSO₄

(c) (i) Sodium Carbonate



(d) (i) Mol HNO₃ = $\frac{MV}{1000} = \frac{0.5 \times 50}{1000}$
= 0.025 mol

Ratio of HNO₃ to salt P (from answer a)

$$\begin{array}{l} 2 \text{ mol} \quad : \quad 1 \text{ mol} \\ 0.025 \text{ mol} : \quad 0.05 \text{ mol} \end{array}$$

0.05 mol salt P is produce.

(ii) 0.05 mol P is produce, answer from (d)(i) then used ionic equation in (c)(ii)

Ratio mol P to MgCO₃

1 mol to 1 mol

0.05 mol to 0.05 mol

Mass MgCO₃ = mol X molar mass = $0.05 \times [24 + 12 + 16 \times 3] = 0.05 \times 84$
= 4.2 g

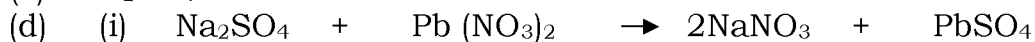
(e) Heat strong the magnesium carbonate, it will decompose to magnesium oxide and carbon dioxide

[SPM05-04]

(a) cation

(b) Cu²⁺ ions & SO₄²⁻ ions , H⁺ ions & OH⁻ ions

(c) Na₂SO₄



(ii) 1 mol of lead(II) nitrate reacts with 1 mol of sodium nitrate produce 1 mol of lead(II) sulphate and 2 moles of sodium nitrate

(iii) Lead(II) sulphate

(iv) Number of mole = $\frac{10}{1000} \times 0.5 = 0.005$

(v) Mass = $0.005 \times (207 + 32 + 16 \times 4)$ (or 0.005×303) = 1.515 g