

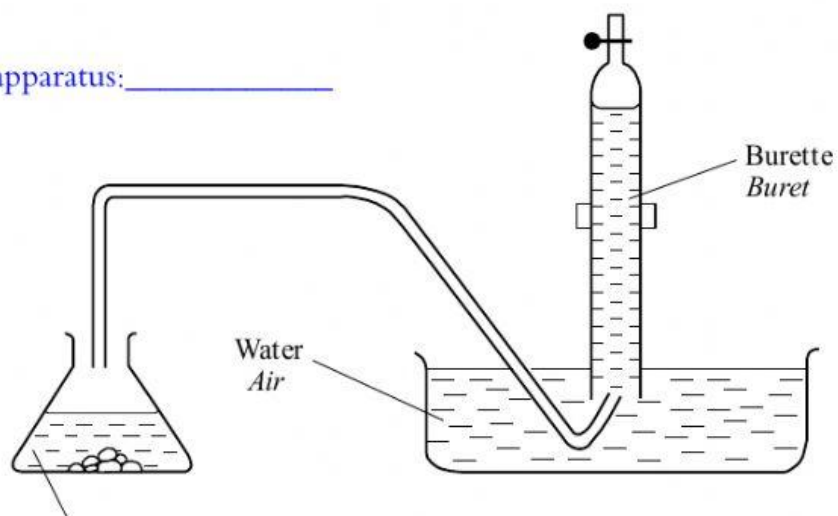
- 4 Two experiments were carried out to investigate factors that affect the rate of reaction. Table 4 shows the description of each experiment.  
*Dua eksperimen telah dijalankan untuk mengkaji faktor mempengaruhi kadar suatu tindak balas.*  
*Jadual 4 menunjukkan perincian setiap eksperimen.*

| Experiment<br><i>Eksperimen</i> | Reactant<br><i>Bahan tindak balas</i>                                                                                                                                                                                                                                   | Temperature, °C<br><i>Suhu, °C</i> | Time taken for<br>collecting 30 cm <sup>3</sup> of<br>gas released, (s)<br><i>Masa yang diambil<br/>untuk mengumpul 30<br/>cm<sup>3</sup> gas yang<br/>terbebas, (s)</i> |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I                               | Excess zinc powder +<br>20 cm <sup>3</sup> of 0.1 mol dm <sup>-3</sup><br>sulphuric acid<br><br><i>Serbuk zink berlebihan<br/>+ 20 cm<sup>3</sup> asid sulfurik<br/>0.1 mol dm<sup>-3</sup></i>                                                                         | 30.0                               | 20.0                                                                                                                                                                     |
| II                              | Excess zinc powder +<br>20 cm <sup>3</sup> of 0.1 mol dm <sup>-3</sup><br>sulphuric acid +<br>copper(II) sulphate<br>solution<br><br><i>Serbuk zink berlebihan<br/>+ 20 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup><br/>asid sulfurik + larutan<br/>kuprum(II) sulfat</i> | 30.0                               | 12.0                                                                                                                                                                     |

Table 4  
*Jadual 4*

- (a) Complete the diagram 4 with a suitable apparatus.  
 Lengkapkan rajah 4 dengan radas yang sesuai.

Suitable apparatus: \_\_\_\_\_



20 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> of sulphuric acid + excess zinc granules  
 20 cm<sup>3</sup> asid sulfurik 0.1 mol dm<sup>-3</sup> + ketulan zink berlebihan

Diagram 4  
 Rajah 4

[1 mark]  
 [1 markah]

- (b) Write the chemical equation for the reaction between zinc and sulphuric acid.  
 Tuliskan persamaan kimia bagi tindak balas antara zink dan asid sulfurik

\_\_\_\_\_

[2 marks]  
 [2 markah]

- (c) Calculate the average rate of the reaction for experiment I and experiment II in cm<sup>3</sup> s<sup>-1</sup>.  
 Kira purata kadar tindakbalas untuk eksperimen I dan eksperimen II dalam unit cm<sup>3</sup> s<sup>-1</sup>

(i) Experiment I = \_\_\_\_\_  
 Eksperimen I

(ii) Experiment II = \_\_\_\_\_  
 Eksperimen II

[2 marks]  
 [2 markah]

- (d) By using collision theory,  
Explain the difference in the rate of reaction between Experiment I and Experiment II.  
*Dengan menggunakan teori perlanggaran,*  
*Terangkan mengapa terdapat perbezaan dalam kadar tindak balas antara Eksperimen I dan II.*

The rate of reaction in Exp II is \_\_\_\_\_ than Exp I

Catalyst \_\_\_\_\_ the \_\_\_\_\_ in Exp II

The frequency of collision between \_\_\_\_\_ ion and \_\_\_\_\_ atom in Exp II is \_\_\_\_\_ than Exp 1

The frequency of effective collision between \_\_\_\_\_ ion and \_\_\_\_\_ atom is \_\_\_\_\_ in Exp II

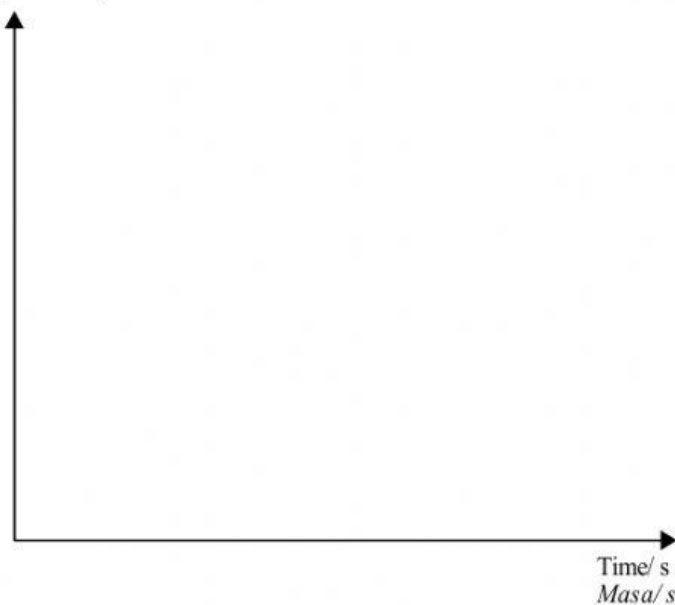
[3 marks]

[3 markah]

- (e) Sketch the graphs of volume of gas collected against time for experiment I and experiment II in the same axis.

*Lakarkan graf isipadu gas dikumpul melawan masa bagi eksperimen I dan eksperimen II dalam paksi yang sama.*

Volume of gas collected/ cm<sup>3</sup>  
*Isipadu gas dikumpul/ cm<sup>3</sup>*



[2 marks]

[2 markah]

- 5 Diagram 5 shows the conversion of lead(II) nitrate.  
*Rajah 5 menunjukkan pertukaran bagi plumbum(II) nitrat.*

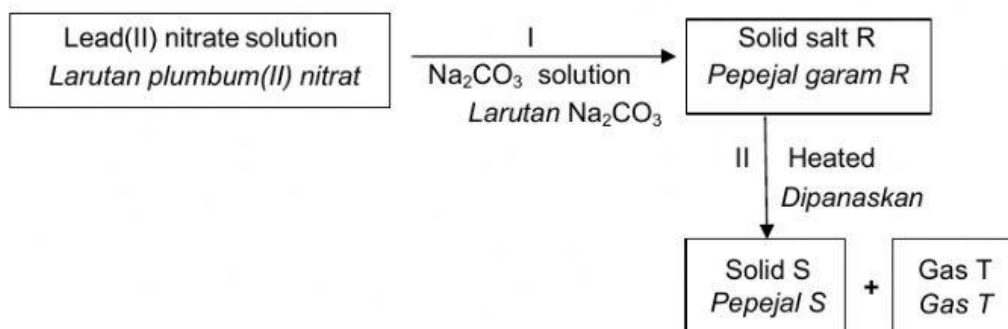


Diagram 5  
*Rajah 5*

- (a) (i) Write the chemical formula of lead(II) nitrate.  
*Tuliskan formula kimia untuk plumbum(II) nitrat.*

.....

[1 mark]

[1 markah]

- (ii) Name the reaction I.  
*Namakan tindak balas I.*

.....

[1 mark]

[1 markah]

- (b) Based on Diagram 5, identify salt R, solid S and gas T.  
*Berdasarkan Rajah 5, kenal pasti garam R, pepejal S dan gas T.*

R : .....

S : .....

T : .....

[3 marks]

[3 markah]

- (c) State the colour of solid S.  
Nyatakan warna pepejal S.

[1 mark]

[1 markah]

- (d) (i) Draw a labelled diagram for heating solid salt R in Reaction II.  
Lukiskan rajah berlabel bagi pemanasan pepejal garam R dalam tindak balas II.

[2 marks]

[2 markah]

- (ii) Write a chemical equation for Reaction II.  
Tuliskan persamaan kimia bagi tindak balas II



[1 mark]

[1 markah]

- (e) 2.67 g of salt R is heated in the laboratory. Calculate volume of gas T released at room condition.

[Molar mass solid salt  $P = 267 \text{ g mol}^{-1}$ ; 1 mol gas occupies  $24 \text{ dm}^3$  at room conditions]

2.67 g garam R dipanaskan di dalam makmal. Hitungkan isi padu gas T yang dibebaskan dalam keadaan bilik.

[Jisim molar pepejal garam  $P = 267 \text{ g mol}^{-1}$ ; 1 mol gas menempati  $24 \text{ dm}^3$  pada keadaan bilik]

Balance chemical eq:

1) Find no of mol

2) Compare no of mol

3) Find V

[2 marks]

[2 markah]