

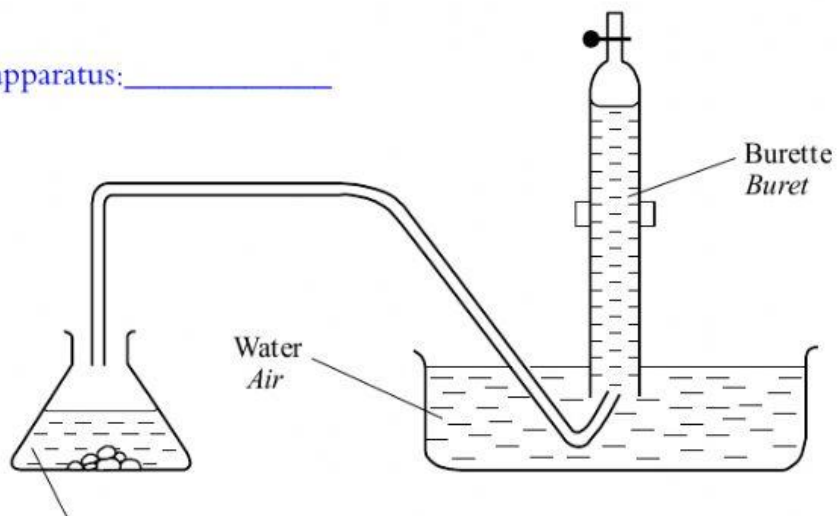
- 4 Two experiments were carried out to investigate factors that affect the rate of reaction. Table 4 shows the description of each experiment.
Dua eksperimen telah dijalankan untuk mengkaji faktor mempengaruhi kadar suatu tindak balas.
Jadual 4 menunjukkan perincian setiap eksperimen.

Experiment Eksperimen	Reactant Bahan tindak balas	Temperature, °C Suhu, °C	Time taken for collecting 30 cm³ of gas released, (s) Masa yang diambil untuk mengumpul 30 cm³ gas yang terbebas, (s)
I	Excess zinc powder + 20 cm ³ of 0.1 mol dm ⁻³ sulphuric acid <i>Serbuk zink berlebihan + 20 cm³ asid sulfurik 0.1 mol dm⁻³</i>	30.0	20.0
II	Excess zinc powder + 20 cm ³ of 0.1 mol dm ⁻³ sulphuric acid + copper(II) sulphate solution <i>Serbuk zink berlebihan + 20 cm³ of 0.1 mol dm⁻³ asid sulfurik + larutan 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 cm³ of 0.1 mol dm⁻³ of sulphuric acid + excess zinc granules
 20 cm³ asid sulfurik 0.1 mol dm⁻³ + 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 cm³ s⁻¹.
 Kira purata kadar tindakbalas untuk eksperimen I dan eksperimen II dalam unit cm³ s⁻¹

(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 I

.....
 The frequency of effective collision between _____ ion and _____ atom is _____ in Exp II

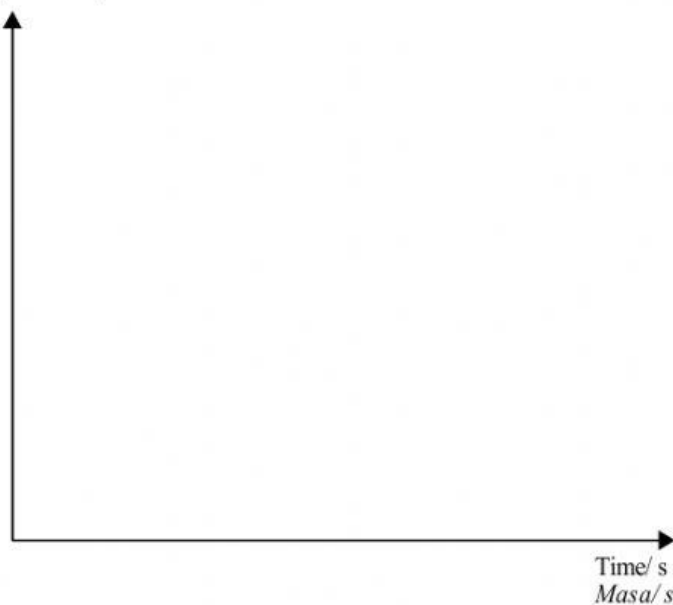
[3 marks]

[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/ cm³
Isipadu gas dikumpul/ cm³



[2 marks]

[2 markah]

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

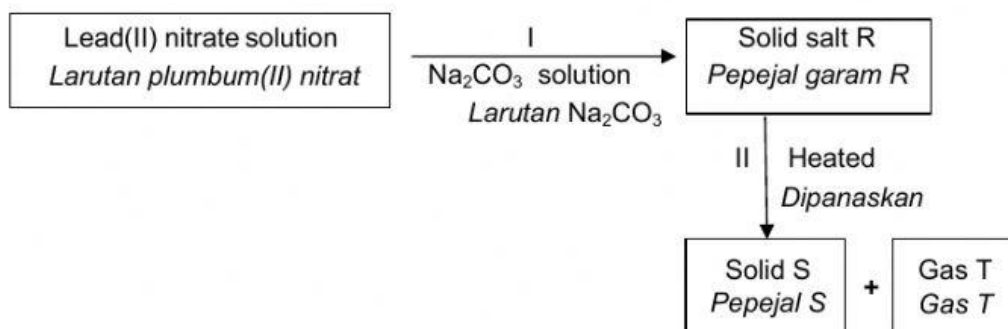


Diagram 5
Rajah 5

- (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 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 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]