

**CONFIDENTIAL**

**4541/1**

**Chemistry**

**Paper 1**

**September**

**2012**

**1 1/4 hour**



**SPM TRIAL EXAMINATION 2012  
MARA JUNIOR SCIENCE COLLEGE**

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**CHEMISTRY**

**Paper 1**

One hour and fifteen minutes

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**DO NOT OPEN THE QUESTION BOOK  
UNTIL BEING TOLD TO DO SO.**

1. This question booklet is bilingual  
*Kertas soalan ini adalah dalam dwibahasa*
2. Candidates are advised to read INFORMATION FOR CANDIDATES on page 28  
*Calon dikehendaki membaca MAKLUMAT UNTUK PELAJAR di halaman 28*

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This question booklet has 28 printed pages

- 1 What is the number of molecules in 1 mole of carbon dioxide, CO<sub>2</sub>?  
*Berapakah bilangan molekul di dalam 1 mol karbon dioksida, CO<sub>2</sub>?*  
[Avogadro constant [Pemalar Avogadro] =  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]
- A  $6.02 \times 10^{23}$   
B  $1.20 \times 10^{23}$   
C  $1.50 \times 10^{23}$   
D  $2.40 \times 10^{23}$
- 2 Why are weather balloons filled with helium rather than hydrogen?  
*Mengapakah belon kaji cuaca diisi dengan gas helium bukannya hidrogen?*
- A Helium is found in air  
*Helium terdapat di udara*  
B Helium is less dense than hydrogen.  
*Helium kurang tumpat dari hidrogen*  
C Helium is a monoatomic gas  
*Helium adalah gas monoatom*  
D Helium is unreactive  
*Helium tidak reaktif*
- 3 Which of the following are true of covalent compounds?  
*Manakah antara berikut adalah benar mengenai sebatian kovalen?*
- I Usually volatile  
*Biasanya meruap*  
II Soluble in organic solvents  
*Larut dalam pelarut organik*  
III Formed by the sharing of electrons between atoms  
*Terhasil melalui perkongsian elektron antara atom-atom.*  
IV Conduct electricity in molten state  
*Mengkonduksi elektrik dalam keadaan leburan.*
- A I and II  
*I dan II*  
B III and IV  
*III dan IV*  
C I, II and III  
*I, II dan III*  
D I, II, III and IV  
*I, II, III dan IV*

- 4 Which chemical formula correspond to the named compound?  
 Formula kimia manakah yang sepadan dengan sebatian yang dinamakan?

	Compound <i>Sebatian</i>	Chemical formula <i>Formula kimia</i>
A	Sodium hydroxide <i>Natrium hidroksida</i>	NaOH
B	Lead(II) bromide <i>Plumbum(II) bromida</i>	PbBr
C	Hydrochloric acid <i>Asid hidroklorik</i>	HOCl
D	Sulphur dioxide <i>Sulfur dioksida</i>	SO

Table 1  
 Jadual 1

- 5 Diagram 1 shows the position of four elements in the Periodic Table.  
 Which element is most likely to form an acidic oxide?  
 Rajah 1 menunjukkan kedudukan empat unsur dalam Jadual Berkala.  
 Unsur manakah akan membentuk oksida asid?

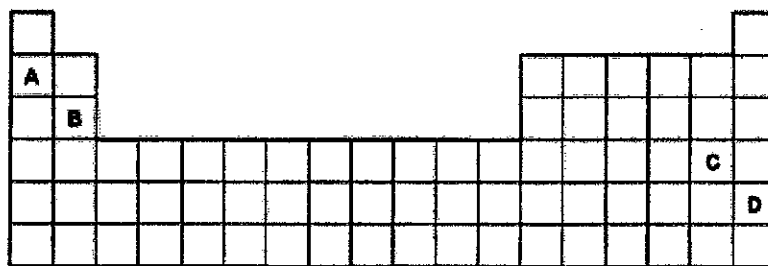


Diagram 1  
 Rajah 1

- 6 What are formed when glucose is fermented?  
 Apakah yang terhasil apabila glukosa mengalami penapaian?
- A Ethanol and carbon dioxide  
*Etanol dan karbon dioksida*
  - B Ethanol and oxygen  
*Etanol dan oksigen*
  - C Ethene and carbon dioxide  
*Etena dan karbon dioksida*
  - D Ethene and oxygen  
*Etena dan oksigen*

- 7 Diagram 2 shows an iron nail that is placed in a closed test-tube containing gas L. The nail rusts after a few days.

Rajah 2 menunjukkan sebatang paku besi yang diletakkan di dalam sebuah tabung uji bertutup yang mengandungi gas L.

Paku itu berkarat selepas beberapa hari.

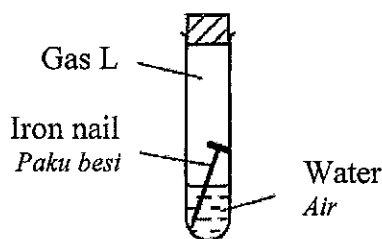


Diagram 2  
Rajah 2

What is gas L?

Apakah gas L?

- A Carbon dioxide  
*Karbon dioksida*
- B Hydrogen  
*Hidrogen*
- C Nitrogen  
*Nitrogen*
- D Oxygen  
*Oksigen*
- 8 Diagram 3 shows the set-up of the apparatus for electrolysis.  
Rajah 3 menunjukkan susunan radas bagi elektrolisis.

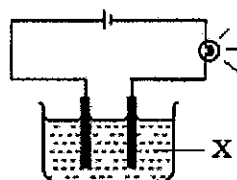


Diagram 3  
Rajah 3

Which of the following compounds could be used as substance X?

Manakah antara sebatian berikut boleh digunakan sebagai bahan X?

- A Glucose solution,  $C_6H_{12}O_6$   
*Larutan glukosa,  $C_6H_{12}O_6$*
- B Sodium chloride solution, NaCl  
*Larutan natrium klorida, NaCl*
- C Chloromethane,  $CH_3Cl$   
*Klorometana,  $CH_3Cl$*
- D Ethyl ethanoate,  $CH_3COOC_2H_5$   
*Etil etanoat,  $CH_3COOC_2H_5$*

- 9 What are the ions present in molten sodium chloride and aqueous sodium chloride?  
 Apakah ion-ion yang wujud dalam leburan natrium klorida dan natrium klorida akueus?

	Molten sodium chloride <i>Leburan natrium klorida</i>	Aqueous sodium chloride <i>Natrium klorida akueus</i>
A	$\text{Na}^+, \text{H}^+, \text{Cl}^-, \text{OH}^-$	$\text{Na}^+, \text{H}^+, \text{Cl}^-$
B	$\text{Na}^+, \text{Cl}^-$	$\text{OH}^-, \text{Cl}^-$
C	$\text{Na}^+, \text{Cl}^-$	$\text{Na}^+, \text{Cl}^-, \text{H}^+, \text{OH}^-$
D	$\text{Na}^+, \text{OH}^-$	$\text{Na}^+, \text{Cl}^-, \text{H}^+, \text{OH}^-$

- 10 Diagram 4 is a graph of the pH of soil in a farm against time.  
 At which point was the soil neutral?  
*Rajah 4 adalah graf pH tanah di sebuah ladang melawan masa.*  
*Pada titik manakah tanah itu neutral?*

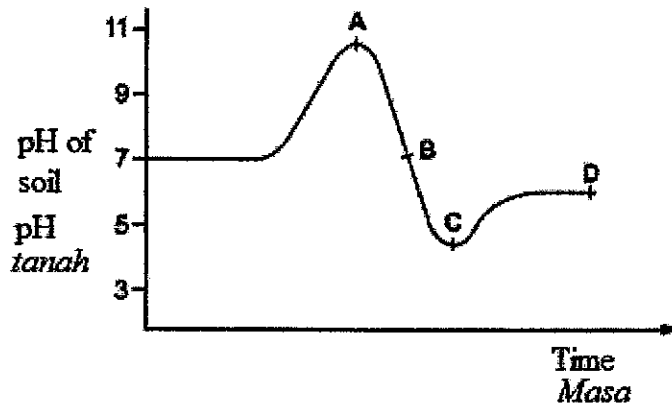


Diagram 4  
 Rajah 4

- 11 A student adds 2 g of calcium carbonate to 20 cm<sup>3</sup> of dilute hydrochloric acid at different temperatures. She measures the time taken for effervescence to stop.  
 Which apparatus does she use in the experiment?  
*Seorang pelajar menambahkan 2 g kalsium karbonat kepada 20 cm<sup>3</sup> asid hidroklorik cair pada suhu berbeza. Dia mengukur masa diambil untuk pembuakan berhenti.*  
*Apakah radas yang diperlukan dalam eksperimen tersebut?*

	Balance <i>Penimbang</i>	Stopwatch <i>Jam randik</i>	Measuring cylinder <i>Silinder penyukat</i>	Thermometer <i>Termometer</i>
A	✓	✓	✓	×
B	✓	✓	✓	✓
C	✓	×	✓	✓
D	×	✓	×	✓

- 12 Diagram 5 shows the results when aqueous sodium hydroxide is added to two different solutions.

Rajah 5 menunjukkan keputusan apabila larutan natrium hidroksida ditambah kepada dua larutan berbeza.

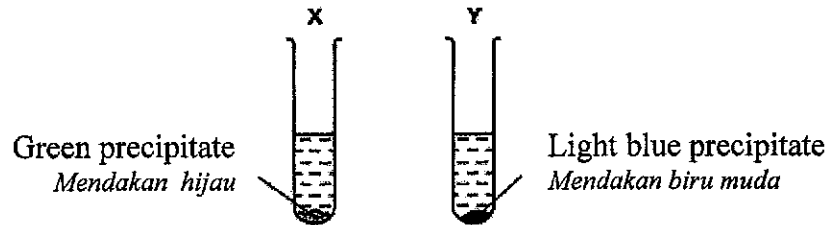


Diagram 5  
Rajah 5

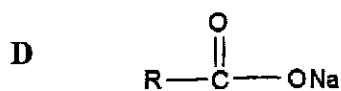
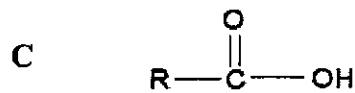
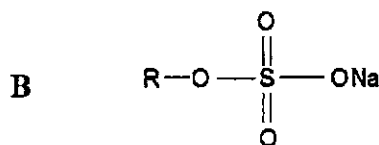
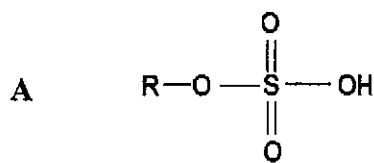
What are the cations present in X and Y?

Apakah kation yang hadir dalam X dan Y?

	X	Y
A	Copper(II) Kuprum(II)	Iron(II) Ferum(II)
B	Copper(II) Kuprum(II)	Iron(III) Ferum(III)
C	Iron(II) Ferum(II)	Copper(II) Kuprum(II)
D	Iron(III) Ferum(III)	Copper(II) Kuprum(II)

- 13 Which of the following is a structural formula of soap?

Manakah antara formula struktur berikut merupakan sabun?



- 14 Diagram 6 shows the flow chart for the industrial manufacture of sulphuric acid.  
Rajah 6 menunjukkan carta alir bagi penghasilan asid sulfurik secara industri.

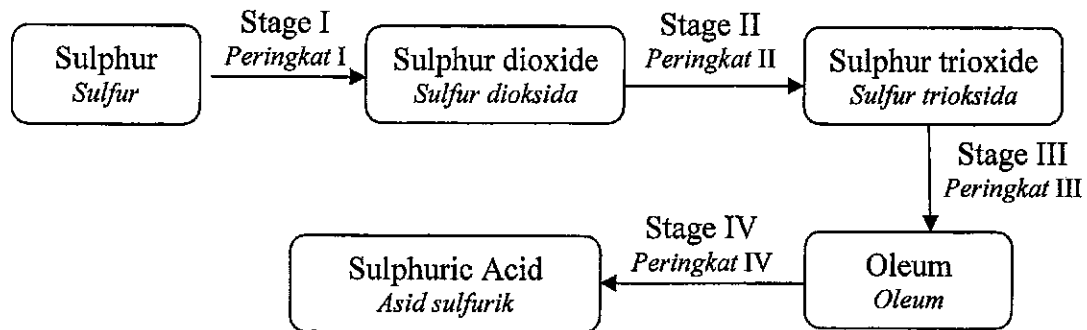


Diagram 6  
Rajah 6

Which of the stages uses catalyst?  
Pada peringkat manakah mungkin digunakan?

- A Stage I  
Peringkat I
- B Stage II  
Peringkat II
- C Stage III  
Peringkat III
- D Stage IV  
Peringkat IV
- 15 Diagram 7 shows three types of item.  
Rajah 7 menunjukkan tiga jenis item.

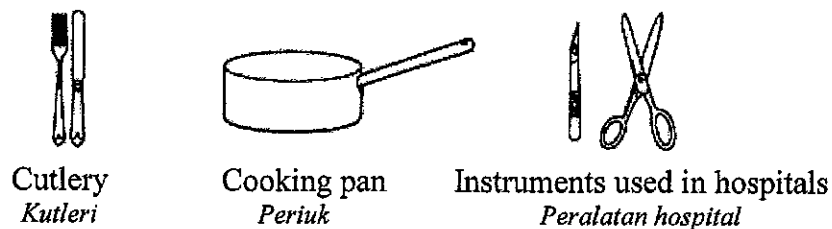


Diagram 7  
Rajah 7

Which method of rust prevention can be used for all three types of item?  
Kaedah pencegahan pengurangan yang manakah boleh digunakan untuk ketiga-tiga jenis item tersebut?

- A Coating with plastic  
Menyalut dengan plastik
- B Covering with grease  
Menyapu gris
- C Galvanising  
Penggalian
- D Alloying  
Pengaloiian

- 16 Diagram 8 shows reactions of a substance W.  
*Rajah 8 menunjukkan beberapa tindak balas bagi bahan W.*

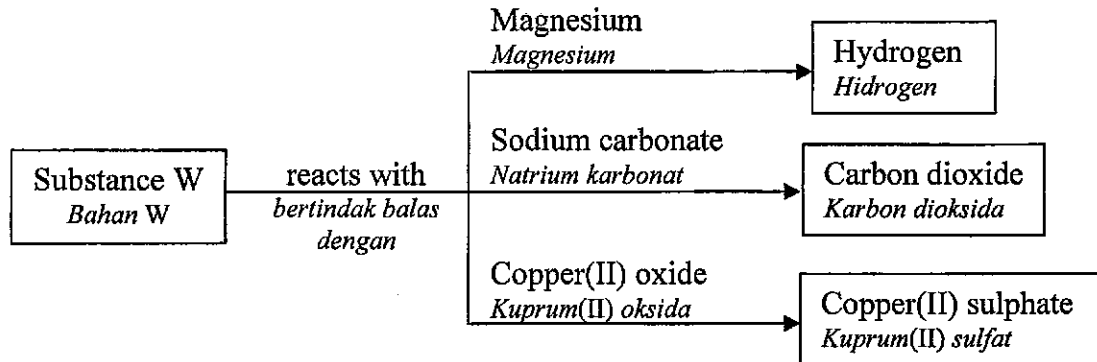


Diagram 8  
*Rajah 8*

What type of substance is W?  
*Apakah jenis bahan W?*

- A Acid  
*Asid*
  - B Base  
*Bes*
  - C Element  
*Unsur*
  - D Salt  
*Garam*
- 17 Diagram 9 shows a cup of tea.  
*Rajah 9 menunjukkan secawan teh.*



Diagram 9  
*Rajah 9*

Which pairs describes the water particles in the air compared with the water particles in the cup?

*Pasangan manakah menerangkan zarah air di udara berbanding dengan zarah air di dalam cawan?*

	Moving faster <i>Bergerak lebih laju</i>	Closer together <i>Lebih rapat</i>
A	✓	✓
B	×	×
C	×	✓
D	✓	×



- 18 Diagram 10 shows the formation of clouds when water evaporates from the sea.  
Rajah 10 menunjukkan pembentukan awan apabila air tersejat dari laut.

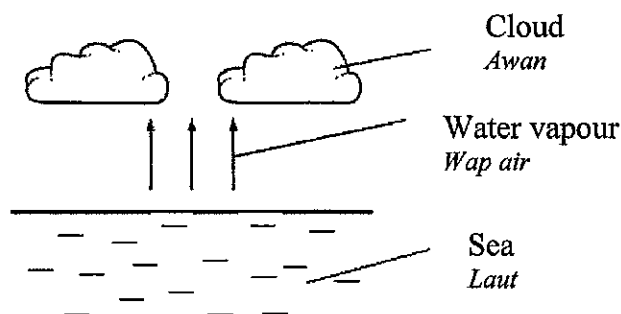


Diagram 10  
Rajah 10

What is the change in energy and type of reaction when water evaporates?  
Apakah perubahan tenaga dan jenis tindak balas apabila air tersejat?

	<b>Energy change</b> <i>Perubahan tenaga</i>	<b>Type of Reaction</b> <i>Jenis Tindak balas</i>
A	Energy given out <i>Tenaga dibebaskan</i>	Endothermic <i>Endotermik</i>
B	Energy given out <i>Tenaga dibebaskan</i>	Exothermic <i>Eksotermik</i>
C	Energy absorbed <i>Tenaga diserap</i>	Endothermic <i>Endotermik</i>
D	Energy absorbed <i>Tenaga diserap</i>	Exothermic <i>Eksotermik</i>

- 19 Which food additive is correctly matched to its function?  
Bahan tambah makanan manakah yang dipadankan betul dengan fungsinya?

	<b>Food additive</b> <i>Bahan tambah makanan</i>	<b>Function</b> <i>Fungsi</i>
A	Sodium benzoate <i>Natrium benzoat</i>	Enhance the natural flavour <i>Menambah rasa semulajadi</i>
B	Aspartame <i>Aspartam</i>	Prevent food from spoiling <i>Mencegah kerosakan makanan</i>
C	Gelatin <i>Gelatin</i>	Restore the color <i>Mengekalkan warna</i>
D	Ascorbic acid <i>Asid askorbik</i>	Prevent oxidation <i>Mencegah pengoksidaan</i>

- 20 Table 1 shows the properties of four elements P, Q, R and S.  
*Jadual 1 menunjukkan sifat bagi empat unsur P, Q, R dan S.*

Element <i>Unsur</i>	Electrical conductivity in liquid <i>Kekonduksian elektrik dalam keadaan cecair</i>	Electrical conductivity in solid <i>Kekonduksian elektrik dalam keadaan pepejal</i>
P	High <i>Tinggi</i>	High <i>Tinggi</i>
Q	High <i>Tinggi</i>	Low <i>Rendah</i>
R	Low <i>Rendah</i>	Low <i>Rendah</i>
S	Low <i>Rendah</i>	High <i>Tinggi</i>

Table 1  
*Jadual 1*

Which element is a metal?  
*Unsur manakah adalah logam?*

- A P  
 B Q  
 C R  
 D S
- 21 Table 2 shows the melting and boiling points of substances S, T, U and V.  
*Jadual 2 menunjukkan takat lebur dan takat didih bagi bahan S, T, U dan V.*

Substance <i>Bahan</i>	Melting point / °C <i>Takat lebur</i>	Boiling point / °C <i>Takat didih</i>
S	-25	5
T	50	300
U	-256	-192
V	10	140

Table 2  
*Jadual 2*

Which of the following substances is a liquid at room temperature?  
*Manakah antara berikut merupakan cecair pada suhu bilik?*

- A S  
 B T  
 C U  
 D V

22 Which compound has the highest number of oxygen atoms when written as formulae?  
*Sebatian manakah mempunyai bilangan atom oksigen terbanyak apabila ditulis sebagai formula?*

- A Iron(III) oxide  
*Ferum(III) oksida*
- B Copper(II) oxide  
*Kuprum(II) oksida*
- C Calcium oxide  
*Kalsium oksida*
- D Potassium oxide  
*Kalium oksida*

23 Table 3 shows the proton number of elements in Period 3.  
*Jadual 3 menunjukkan nombor proton bagi unsur dalam Kala 3.*

<b>Element</b> <i>Unsur</i>	Na	Mg	Al	Si	P	S	Cl	Ar
<b>Proton number</b> <i>Nombor proton</i>	11	12	13	14	15	16	17	18

Table 3  
*Jadual 3*

Which of the following represent changes from left to right across the period?  
*Manakah antara berikut mewakili perubahan merentasi kala dari kiri ke kanan?*

- I Increase in atomic size  
*Pertambahan saiz atom*
  - II Decrease in electronegativity  
*Pengurangan keelektronegatifan*
  - III Increase in number of valence electrons  
*Pertambahan bilangan elektron valens*
  - IV Decrease in metallic properties  
*Pengurangan sifat logam*
- A I and IV  
*I dan IV*
  - B III and IV  
*III dan IV*
  - C II and III  
*II dan III*
  - D I, III and IV  
*I, III dan IV*

- 24 Diagram 11 shows the electron arrangement of a compound formed between elements L and M.  
*Rajah 11 menunjukkan susunan elektron bagi sebatian yang terbentuk daripada unsur L dan M.*

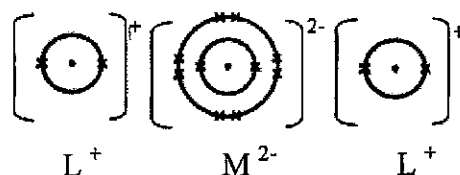


Diagram 11  
*Rajah 11*

In which group is element M located in the Periodic Table of Elements?  
*Dalam kumpulan manakah unsur M terletak dalam Jadual Berkala Unsur?*

- A 2  
 B 8  
 C 16  
 D 18
- 25 Diagram 12 shows an apparatus used to electroplate a metal ring with copper.  
*Rajah 12 menunjukkan radas yang digunakan untuk menyadur cincin logam dengan kuprum.*

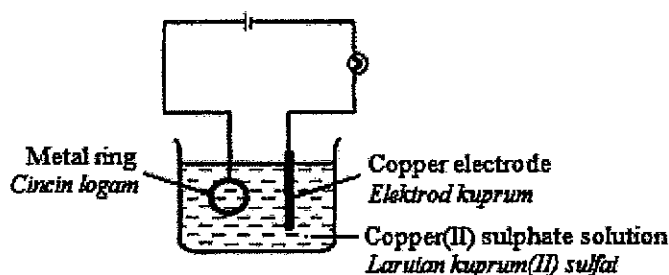
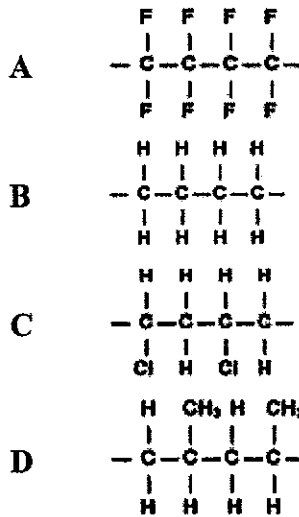


Diagram 12  
*Rajah 12*

The experiment did not work.  
 What change is needed to make the experiment work?  
*Eksperimen ini tidak berjaya.  
 Apakah perubahan yang perlu dilakukan untuk menjayakan eksperimen ini?*

- A Add solid copper(II) sulphate to the electrolyte  
*Tambahkan pepejal kuprum(II)sulfat ke dalam elektrolit*  
 B Increase the temperature of the electrolyte  
*Tingkatkan suhu elektrolit*  
 C Replace the copper electrode by a carbon electrode  
*Gantikan elektrod kuprum dengan elektrod karbon*  
 D Reverse the connections to the battery  
*Songsangkan sambungan litar ke bateri*

- 26 Which of the following polymer is suitable for making water pipes?  
Manakah antara polimer berikut sesuai bagi membuat paip air?



- 27 Diagram 13 shows an experiment in which ammonia is released.  
Rajah 13 menunjukkan satu eksperimen dimana ammonia dibebaskan.

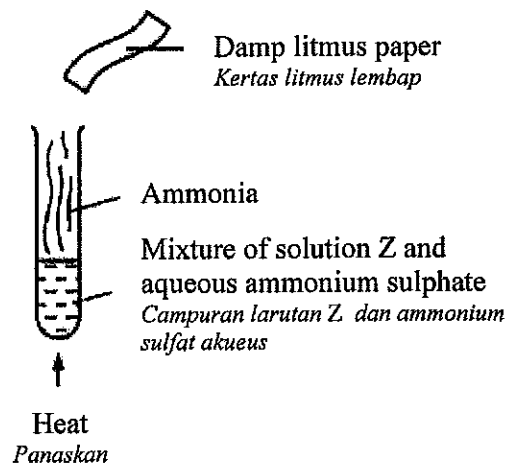


Diagram 13

Rajah 13

- Which combination is correct?  
Pasangan manakah adalah betul?

	<b>Solution Z</b> <i>Larutan Z</i>	<b>Colour change of litmus paper</b> <i>Perubahan warna kertas litmus</i>
A	Aqueous sodium hydroxide <i>Natrium hidroksida akueus</i>	Red to blue <i>Merah ke biru</i>
B	Aqueous sodium hydroxide <i>Natrium hidroksida akueus</i>	Blue to red <i>Biru ke merah</i>
C	Dilute sulphuric acid <i>Asid sulfurik cair</i>	Red to blue <i>Merah ke biru</i>
D	Dilute sulphuric acid <i>Asid sulfurik cair</i>	Blue to red <i>Biru ke merah</i>

28 An aqueous solution of methylamine has a pH greater than 7.

Which statement about methylamine is correct?

*Larutan akueus metilamina mempunyai pH melebihi 7.*

*Penyataan manakah mengenai metilamina adalah betul?*

- A It reacts with hydrochloric acid to form a salt  
*Ia bertindak balas dengan asid hidroklorik menghasilkan garam*
- B It reacts with copper(II) carbonate to give carbon dioxide  
*Ia bertindak balas dengan kuprum(II) karbonat menghasilkan karbon dioksida*
- C It neutralises an aqueous solution of sodium hydroxide  
*Ia meneutralkan larutan akueus natrium hidroksida*
- D It turns blue litmus paper red  
*Ia menukarkan warna kertas litmus biru ke merah*

29 Diagram 14 shows the symbol for two elements.

The letters used are not the actual symbols for the elements.

*Rajah 14 menunjukkan simbol bagi dua unsur.*

*Huruf yang digunakan bukan simbol sebenar bagi unsur itu.*

$$\begin{matrix} 7 \\ 3 \end{matrix} \text{ E}$$

$$\begin{matrix} 23 \\ 11 \end{matrix} \text{ G}$$

Diagram 14

*Rajah 14*

Which of the following statements is true about elements E and G?

*Penyataan manakah yang benar mengenai unsur E dan G?*

- A Element E is more reactive than element G  
*Unsur E adalah lebih reaktif dari unsur G*
- B Atom E has bigger atomic size than atom G  
*Atom E mempunyai saiz atom yang lebih besar dari atom G*
- C Element E has higher melting point than atom G  
*Unsur E mempunyai takat lebur lebih tinggi dari atom G*
- D Element E reacts with G to form a compound with the formula EG  
*Unsur E bertindak balas dengan G untuk membentuk sebatian dengan formula EG*

- 30 Diagram 15 shows the energy profile diagram for a reaction  $P + Q \rightarrow R + S$ .  
 Rajah 15 menunjukkan gambarajah profil tenaga bagi tindak balas  $P + Q \rightarrow R + S$ .

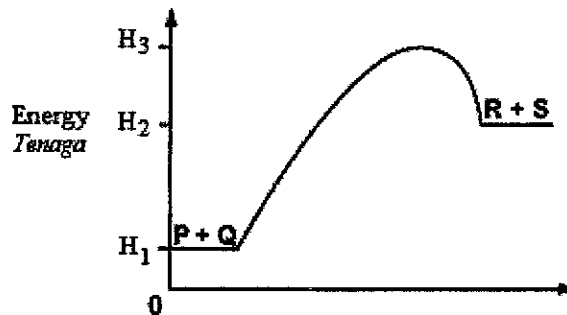
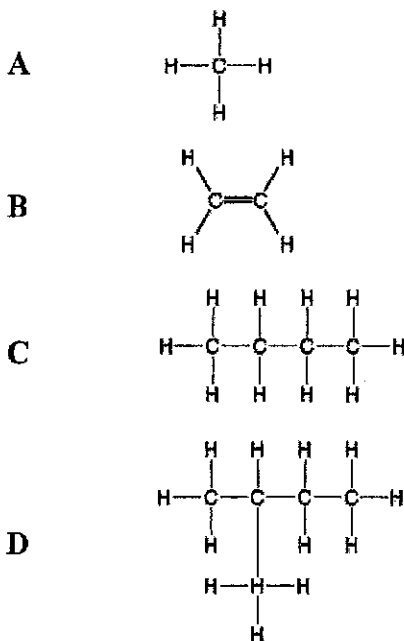


Diagram 15  
 Rajah 15

Which statement is correct?  
 Pernyataan manakah benar?

- A The activation energy of the reaction is  $(H_3 - H_1)$   
 Tenaga pengaktifan bagi tindak balas ialah  $(H_3 - H_1)$
- B Energy level of P+Q is higher than R+S  
 Aras tenaga P+Q lebih tinggi dari R+S
- C The reaction is exothermic  
 Tindak balas adalah eksotermik
- D  $\Delta H$  is  $(H_1 - H_3)$   
 $\Delta H$  ialah  $(H_1 - H_3)$
- 31 Which structural formula shows a compound that belongs to a different homologous series than propane?  
 Formula struktur manakah menunjukkan sebatian bagi siri homolog yang berbeza dari propana?



- 32 A compound has the formula  $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$ .  
Which pair of type of compound and colour change when bromine water is added is correct?

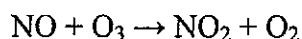
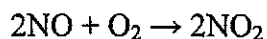
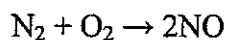
*Satu sebatian mempunyai formula  $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$ .*

*Pasangan jenis sebatian dan perubahan warna apabila air bromin ditambah manakah yang betul?*

	Type of compound <i>Jenis sebatian</i>	Colour change <i>Perubahan warna</i>
A	Saturated <i>Tepu</i>	Brown to colourless <i>Perang ke tanpa warna</i>
B	Saturated <i>Tepu</i>	Colourless to brown <i>Tanpa warna ke perang</i>
C	Unsaturated <i>Tak tepu</i>	Brown to colourless <i>Perang ke tanpa warna</i>
D	Unsaturated <i>Tak tepu</i>	Colourless to brown <i>Tanpa warna ke perang</i>

- 33 The following equations represent the reactions that occur in the air during a thunder storm.

*Persamaan berikut mewakili tindak balas yang berlaku di udara semasa ribut petir.*



What happens to the reactant molecules in each of these reactions?

*Apakah yang berlaku pada molekul bahan tindak balas dalam setiap tindak balas?*

	$\text{N}_2$	$\text{NO}$	$\text{O}_3$
A	Oxidised <i>Dioksidakan</i>	Oxidised <i>Dioksidakan</i>	Oxidised <i>Dioksidakan</i>
B	Oxidised <i>Dioksidakan</i>	Oxidised <i>Dioksidakan</i>	Reduced <i>Diturunkan</i>
C	Reduced <i>Diturunkan</i>	Reduced <i>Diturunkan</i>	Oxidised <i>Dioksidakan</i>
D	Reduced <i>Diturunkan</i>	Reduced <i>Diturunkan</i>	Reduced <i>Diturunkan</i>



- 34 Diagram 16 shows an experiment where zinc oxide powder is added to dilute hydrochloric acid.

Rajah 16 menunjukkan satu eksperimen di mana serbuk zink oksida ditambah ke dalam asid hidroklorik cair.

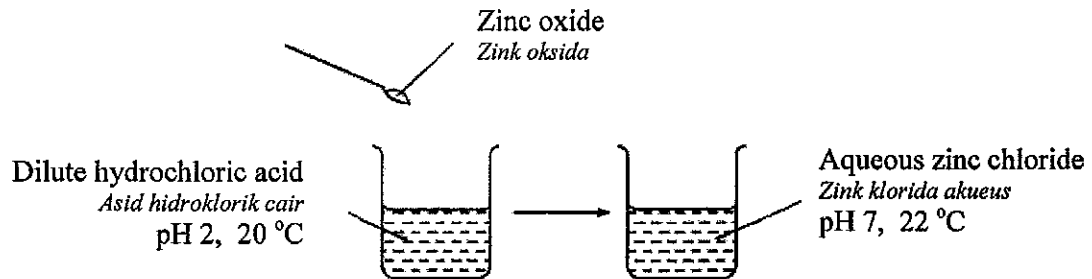


Diagram 16  
Rajah 16

Which terms describe the reaction?

Istilah manakah menerangkan tindak balas tersebut?

	<b>Endothermic</b> <i>Endotermik</i>	<b>Neutralisation</b> <i>Peneutralan</i>
<b>A</b>	✓	✓
<b>B</b>	✓	×
<b>C</b>	×	✓
<b>D</b>	×	×

- 35 A man is diagnosed as having a bacterial infection. He is always restless and normally experience difficulties in breathing.

Which medicine is suitable to treat him?

Seorang lelaki disahkan mengalami jangkitan bakteria. Dia sentiasa resah dan biasanya mengalami masalah pernafasan.

Ubat yang manakah sesuai digunakan untuk merawat lelaki itu?

- A** Aspirin  
*Aspirin*
- B** Streptomycin  
*Streptomisin*
- C** Barbiturate  
*Barbiturat*
- D** Codeine  
*Kodeina*

- 36 A few drops of aqueous potassium iodide and aqueous lead(II) nitrate is placed on opposite side of a damp filter paper.

Diagram 17 shows the formation of yellow precipitate after a few minutes.

*Beberapa titis kalium iodida akueus dan plumbum(II) nitrat akueus diletakkan bertentangan atas sekeping kertas turas lembap.*

*Rajah 17 menunjukkan pembentukan mendakan kuning selepas beberapa minit.*

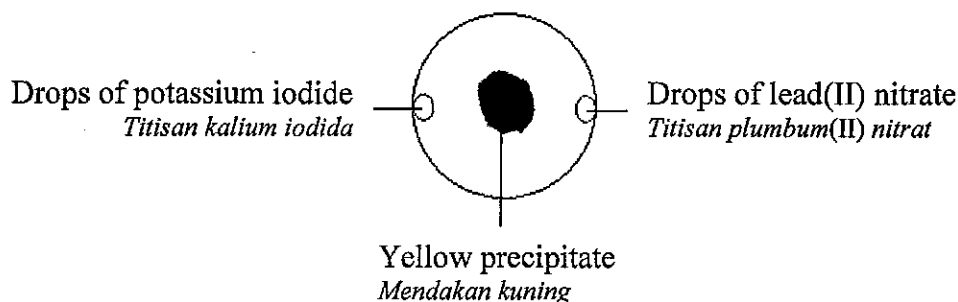


Diagram 17  
*Rajah 17*

How is the precipitate formed?

*Bagaimanakah mendakan terhasil?*

- A** Particles collide, diffuse and then react.  
*Zarah berlanggar, meresap dan kemudian bertindak balas*
- B** Particles collide, react and then diffuse.  
*Zarah berlanggar, bertindak balas dan kemudian meresap*
- C** Particles diffuse, collide and then react.  
*Zarah meresap, berlanggar dan kemudian bertindak balas*
- D** Particles diffuse, react and then collide  
*Zarah meresap, bertindak balas dan kemudian berlanggar*
- 37 One mole of compound J gives three moles of ions in aqueous solution.  
J reacts with ammonium carbonate to give an acidic gas.  
What is compound J?  
*Satu mol sebatian J menghasilkan tiga mol ion dalam larutan akueus.  
J bertindak balas dengan ammonium karbonat menghasilkan gas berasid.  
Apakah sebatian J?*

- A** Calcium hydroxide  
*Kalsium hidroksida*
- B** Ethanoic acid  
*Asid etanoik*
- C** Sodium hydroxide  
*Natrium hidroksida*
- D** Sulphuric acid  
*Asid sulfurik*

- 38 Table 4 shows the proton number for elements W, X, Y and Z.  
*Jadual 4 menunjukkan nombor proton bagi unsur W, X, Y dan Z.*

Element <i>Unsur</i>	W	X	Y	Z
Proton number <i>Nombor Proton</i>	3	9	13	19

Table 4  
*Jadual 4*

Which of the following pair of elements exhibits the same chemical properties?  
*Pasangan unsur manakah mempunyai sifat kimia yang sama?*

- A W and Y  
*W dan Y*
- B X and Y  
*X dan Y*
- C X and Z  
*X dan Z*
- D W and Z  
*W dan Z*
- 39 Which equation represents a reaction for the preparation of a salt that requires the use of a pipette and burette?  
*Persamaan manakah mewakili tindak balas bagi penyediaan garam yang memerlukan pipet dan buret?*
- A  $\text{BaCl}_{2(\text{aq})} + \text{H}_2\text{SO}_{4(\text{aq})} \rightarrow \text{BaSO}_{4(\text{s})} + 2 \text{HCl}_{(\text{aq})}$
- B  $\text{CuO}_{(\text{s})} + 2 \text{HCl}_{(\text{aq})} \rightarrow \text{CuCl}_{2(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
- C  $\text{MgCO}_{3(\text{s})} + \text{H}_2\text{SO}_{4(\text{aq})} \rightarrow \text{MgSO}_{4(\text{aq})} + \text{H}_2\text{O}_{(\text{l})} + \text{CO}_{2(\text{g})}$
- D  $\text{KOH}_{(\text{aq})} + \text{HCl}_{(\text{aq})} \rightarrow \text{KCl}_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$

- 40 Diagram 18 shows the electron arrangement of atoms P and Q.  
Rajah 18 menunjukkan susunan elektron bagi atom P dan Q.

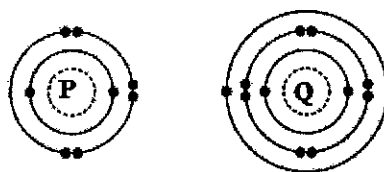


Diagram 18

Rajah 18

P and Q react to form an ionic compound.  
What is the formula of this compound?  
P dan Q bertindak balas membentuk sebatian ionik.  
Apakah formula sebatian tersebut?

- A  $Q_2P$   
B  $QP_2$   
C  $Q_6P_2$   
D  $Q_2P_6$
- 41 Diagram 19 shows an electrolytic circuit using inert electrodes E, F, G and H.  
Rajah 19 menunjukkan satu litar elektrolisis menggunakan elektrod lengai E, F, G dan H.

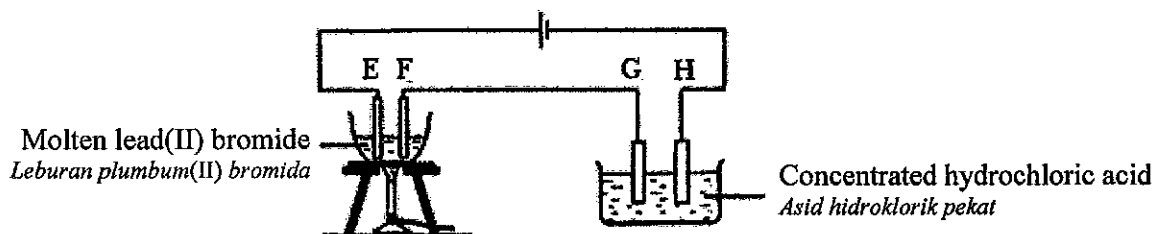


Diagram 19

Rajah 19

At which electrodes are Group 17 elements produced?  
Pada elektrod manakah unsur Kumpulan 17 dihasilkan?

- A E and G  
E dan G  
B F and H  
F dan H  
C E and F  
E dan F  
D F and G  
F dan G

- 42 Diagram 20 shows the reaction of three different metals with dilute hydrochloric acid.  
Rajah 20 menunjukkan tindak balas tiga logam berbeza dengan asid hidroklorik cair.

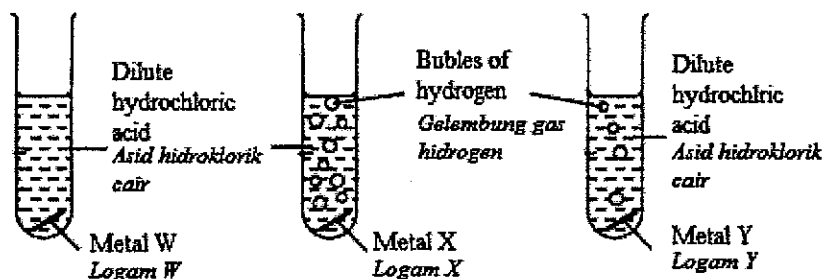


Diagram 20  
Rajah 20

What are the possible metals for W, X and Y?  
Apakah kemungkinan bagi logam W, X dan Y?

	W	X	Y
A	Copper <i>Kuprum</i>	Magnesium <i>Magnesium</i>	Zinc <i>Zink</i>
B	Copper <i>Kuprum</i>	Zinc <i>Zink</i>	Magnesium <i>Magnesium</i>
C	Magnesium <i>Magnesium</i>	Zinc <i>Zink</i>	Copper <i>Kuprum</i>
D	Zinc <i>Zink</i>	Magnesium <i>Magnesium</i>	Copper <i>Kuprum</i>

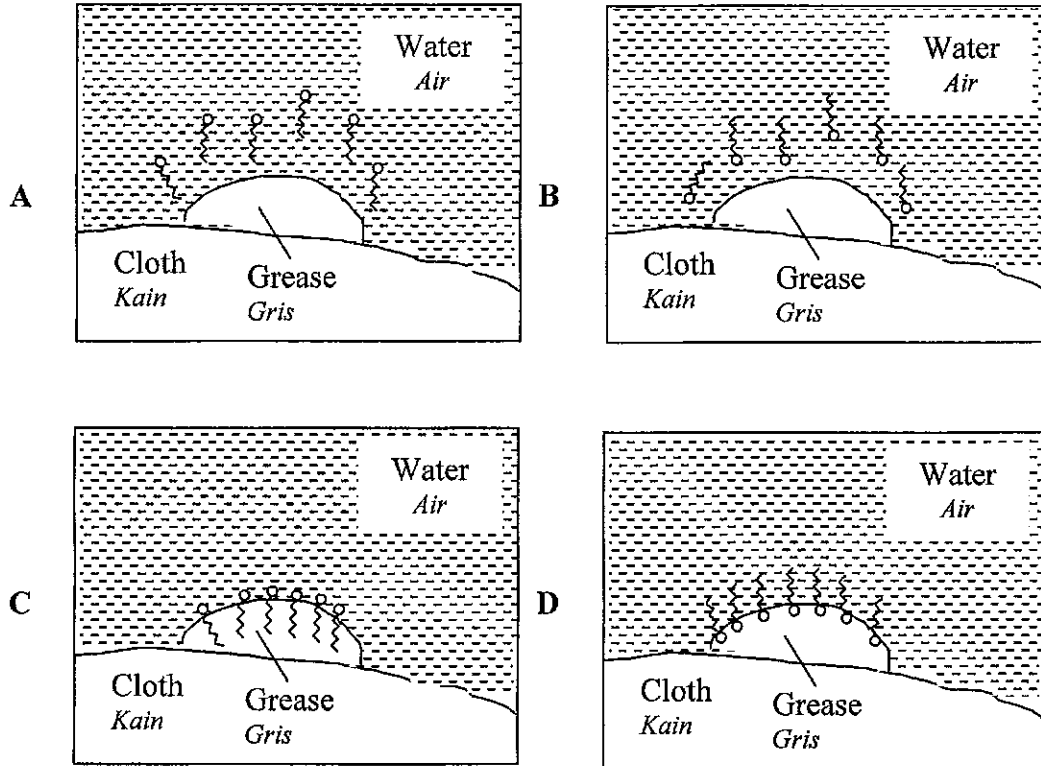
- 43 What is the volume of distilled water required to be added to  $25.0 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  sodium hydroxide in order to produce a solution of  $0.25 \text{ mol dm}^{-3}$ ?  
Berapakah isipadu air suling yang perlu ditambahkan kepada  $25.0 \text{ cm}^3$  natrium hidroksida  $0.5 \text{ mol dm}^{-3}$  untuk menghasilkan larutan  $0.25 \text{ mol dm}^{-3}$ ?

- A  $10.0 \text{ cm}^3$   
B  $25.0 \text{ cm}^3$   
C  $50.0 \text{ cm}^3$   
D  $75.0 \text{ cm}^3$

44

Part of soap anion dissolves in water and another part in grease.  
*Sebahagian dari anion sabun larut dalam air dan sebahagian lagi dalam gris.*

Which diagram represents the above action?  
*Rajah manakah menggambarkan tindakan di atas?*



- 45 The rate of reaction between calcium carbonate and excess hydrochloric acid is studied by collecting the carbon dioxide gas.

Diagram 21 shows the results in a graph.

*Kadar tindak balas antara kalsium karbonat dan asid hidroklorik berlebihan dikaji dengan mengumpulkan gas karbon dioksida.*

*Rajah 21 menunjukkan keputusan dalam bentuk graf.*

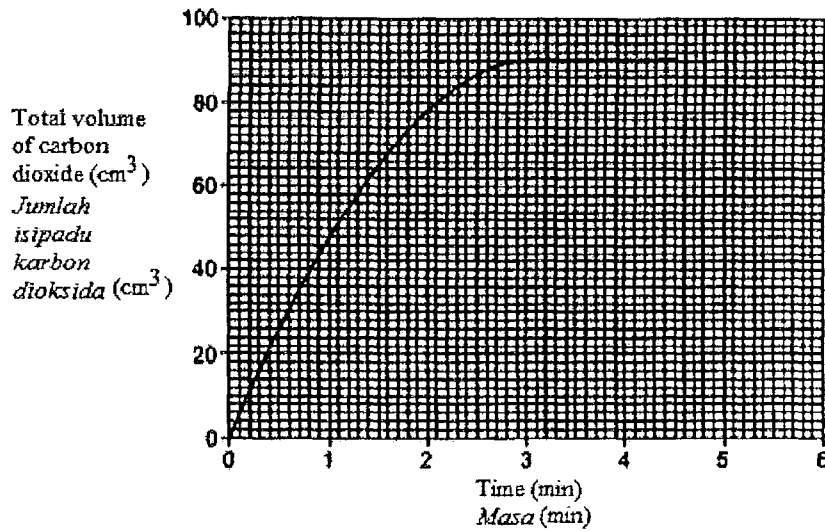


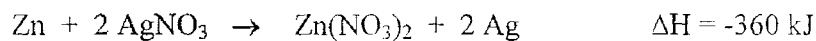
Diagram 21

*Rajah 21*

How much time is required for half of the calcium carbonate to react?

*Berapakah masa yang diperlukan untuk separuh kalsium karbonat bertindak balas?*

- A 0.50 min
  - B 0.95 min
  - C 1.40 min
  - D 2.00 min
- 46 The following thermochemical equation represents the displacement of silver by zinc.



What is the mass of zinc required to release 60.0 kJ of heat?

[Relative atomic mass: Zn= 65]

*Apakah jisim zink yang diperlukan untuk membebaskan 60.0 kJ haba?*

[Jisim atom relatif: Zn= 65]

- A 6.0 g
- B 8.1 g
- C 10.8 g
- D 18.0 g

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SULIT

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- 47 Diagram 22 shows the structure of two types of rubber J and K.  
 Rajah 22 menunjukkan struktur dua jenis getah J dan K.

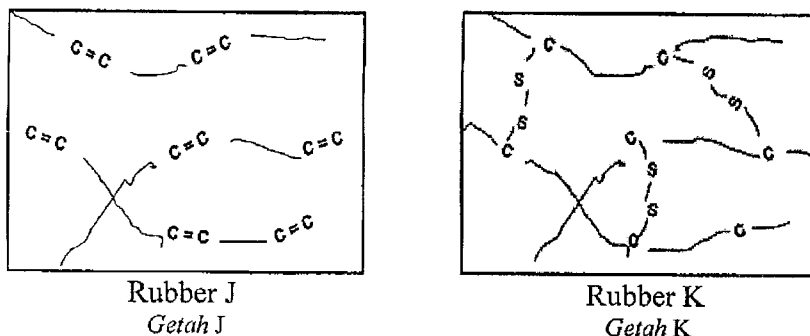
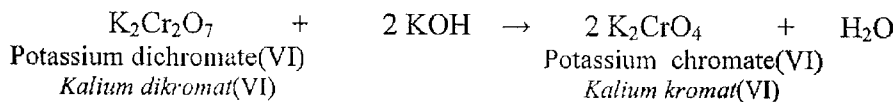


Diagram 22  
 Rajah 22

Which of the following are the correct properties for rubber J and K?  
 Manakah antara berikut adalah sifat yang betul bagi getah J dan K ?

	Rubber J Getah J	Rubber K Getah K
A	More elastic <i>Lebih kenyal</i>	Less elastic <i>Kurang kenyal</i>
B	Strong and hard <i>Kuat dan keras</i>	Weak and soft <i>Lemah dan lembut</i>
C	High melting point <i>Takat lebur tinggi</i>	Low melting point <i>Takat lebur rendah</i>
D	Easy to oxidize <i>Mudah teroksida</i>	Difficult to oxidize <i>Sukar teroksida</i>

- 48 The following equation represents the reaction between potassium hydroxide and potassium dichromate(VI).  
 Persamaan berikut mewakili tindak balas antara kalium hidroksida dan kalium dikromat(VI).



What happens to the oxidation number of chromium and pH of the reaction mixture when aqueous potassium dichromate(VI) is added to aqueous potassium hydroxide?  
 Apakah yang berlaku kepada nombor pengoksidaan kromium dan pH campuran tindak balas apabila kalium dikromat(VI) akueus ditambah kepada kalium hidroksida akueus?

	Oxidation number of the chromium <i>Nombor pengoksidaan kromium</i>	pH of the mixture <i>pH campuran</i>
A	Remains the same <i>Kekal sama</i>	Decreases <i>Berkurang</i>
B	Remains the same <i>Kekal sama</i>	Increases <i>Bertambah</i>
C	Decreases <i>Berkurang</i>	Decreases <i>Berkurang</i>
D	Decreases <i>Berkurang</i>	Increases <i>Bertambah</i>



- 49 Diagram 23 shows the graph of volume of oxygen against time. Curve I represents the decomposition of  $25 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  hydrogen peroxide with manganese(IV) oxide as a catalyst at temperature of  $30^\circ\text{C}$ .  
*Rajah 23 menunjukkan graf isipadu gas oksigen melawan masa. Lengkung I mewakili penguraian  $25 \text{ cm}^3$  hidrogen peroksida  $0.5 \text{ mol dm}^{-3}$  dengan mangkin mangan(IV) oksida pada suhu  $30^\circ\text{C}$ .*

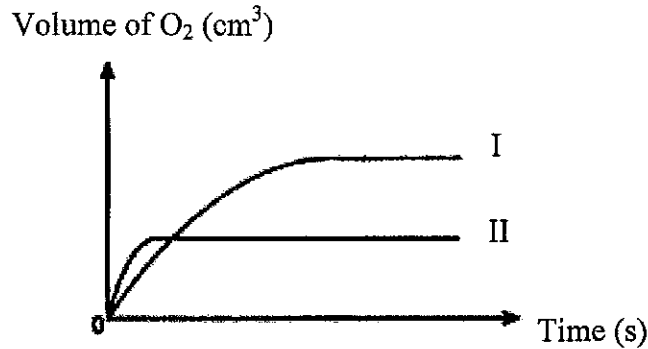


Diagram 23  
*Rajah 23*

Which of the following conditions will produce Curve II?  
*Keadaan manakah akan menghasilkan Lengkung II?*

	Volume of hydrogen peroxide ( $\text{cm}^3$ ) <i>Isipadu hidrogen peroksida</i>	Concentration of $\text{H}_2\text{O}_2$ ( $\text{mol dm}^{-3}$ ) <i>Kepekatan <math>\text{H}_2\text{O}_2</math></i>	Temperature of $\text{H}_2\text{O}_2$ ( $^\circ\text{C}$ ) <i>Suhu <math>\text{H}_2\text{O}_2</math></i>
A	25	1.0	30
B	10	0.7	30
C	15	1.0	30
D	20	0.5	20

50 Diagram 24 shows the set-up of the apparatus to determine the heat of precipitation of barium sulphate.

Rajah 24 menunjukkan gambar rajah susunan radas untuk menentukan haba pemendakan bagi barium sulfat.

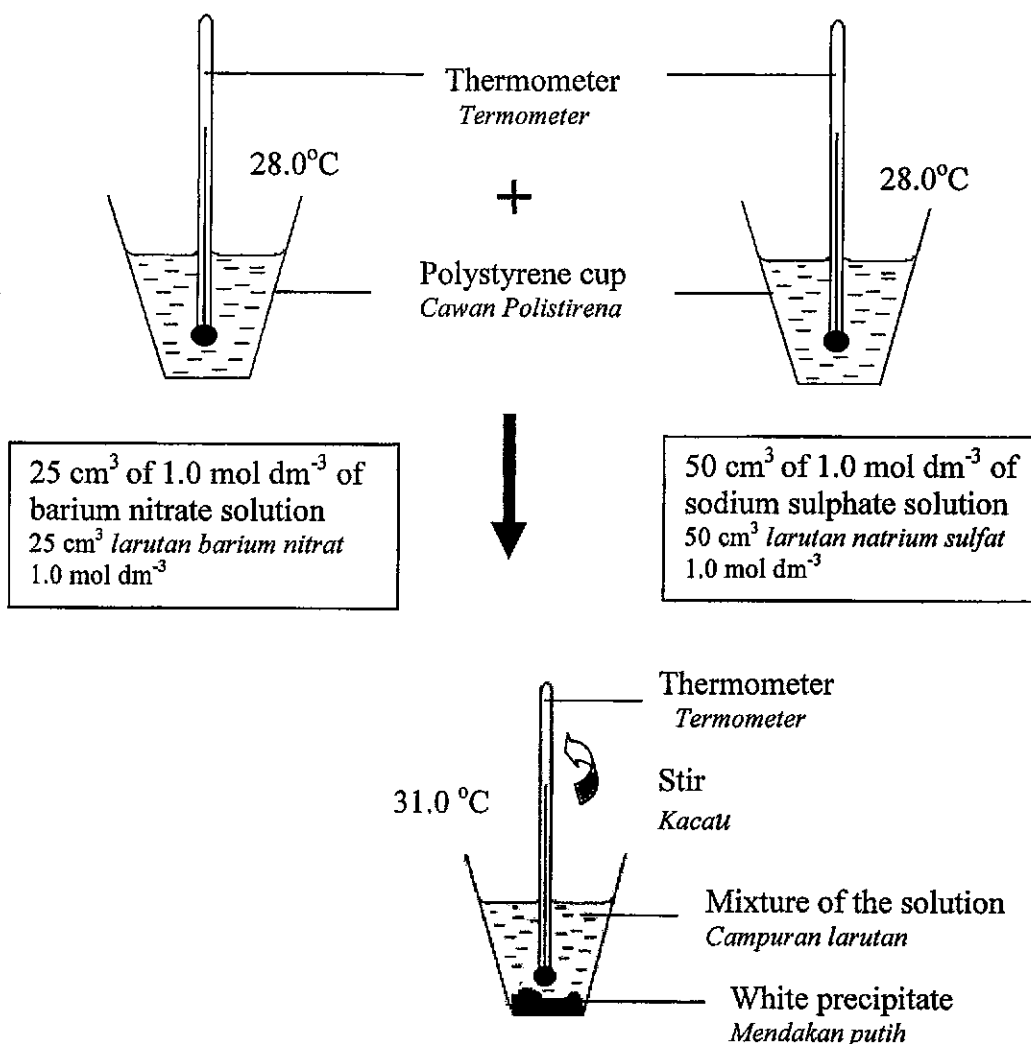


Diagram 24  
Rajah 24

What is the heat of precipitation of barium sulphate?

Berapakah haba pemendakan bagi barium sulfat?

[Specific heat capacity of solution = 4.2 J g<sup>-1</sup> °C<sup>-1</sup>, density of solution = 1 g cm<sup>-3</sup>]  
 [Muatan haba tentu larutan = 4.2 J g<sup>-1</sup> °C<sup>-1</sup>, ketumpatan larutan = 1 g cm<sup>-3</sup>]

- A 18.9 kJ mol<sup>-1</sup>
- B 37.8 kJ mol<sup>-1</sup>
- C 18900 kJ mol<sup>-1</sup>
- D 37800 kJ mol<sup>-1</sup>