

**SULIT**

**4541/1**  
**CHEMISTRY**  
**Kertas 1**  
**Ogos / Sept**  
**1  $\frac{1}{4}$  jam**



**MAJLIS PENGETUA SEKOLAH MALAYSIA**  
**NEGERI SEMBILAN**

**PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5**  
**SEKOLAH-SEKOLAH NEGERI SEMBILAN 2018**

**CHEMISTRY**

Kertas 1

4541/1

Satu jam lima belas minit

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

1. Kertas soalan ini adalah dalam dwibahasa.
2. Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.
3. Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.

*Kertas soalan ini mengandungi 28 halaman bercetak*

## SULIT

1 What is the basic principle used in arranging the elements in the Periodic Table of Elements?  
 Apakah prinsip asas yang digunakan dalam penyusunan unsur-unsur dalam Jadual Berkala Unsur?

- A Increasing order of atomic size  
Tertib menaik saiz atom
- B Increasing order of proton number  
Tertib menaik nombor proton
- C Increasing order of nucleon number  
Tertib menaik nombor nukleon
- D Increasing order of number of valence electron  
Tertib menaik bilangan elektron valens

2 Diagram 1 shows the flow of hydrogen chloride gas into solvent X.  
 Rajah 1 menunjukkan pengaliran gas hidrogen klorida ke dalam pelarut X.

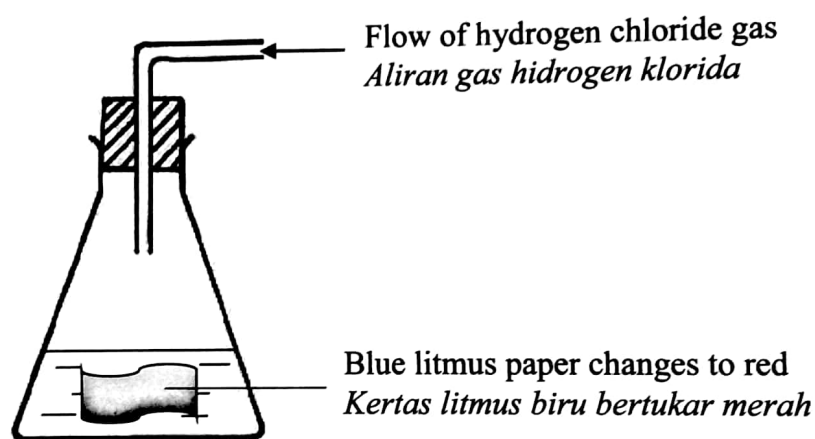


Diagram 1  
Rajah 1

Which of the following is solvent X?  
 Antara yang berikut, yang manakah pelarut X?

- A Water  
Air
- B Propanone  
Propanon
- C Chloroform  
Kloroform
- D Methylbenzene  
Metilbenzena

3 Which substance consists of atom?  
*Bahan manakah terdiri daripada atom?*

- A Glucose  
*Glukosa*
- B Helium  
*Helium*
- C Ammonia aqueous  
*Akueus ammonia*
- D Copper(II) sulphate  
*Kuprum(II) sulfat*

4 Which particle is formed when an atom donates electron?  
*Zarah manakah yang terbentuk apabila satu atom menderma elektron?*

- |                         |                              |
|-------------------------|------------------------------|
| A Anion<br><i>Anion</i> | C Cation<br><i>Kation</i>    |
| B Atom<br><i>Atom</i>   | D Molecule<br><i>Molekul</i> |

5 Diagram 2 shows an apparatus set-up of electrolysis.  
*Rajah 2 menunjukkan susunan radas untuk elektrolisis.*

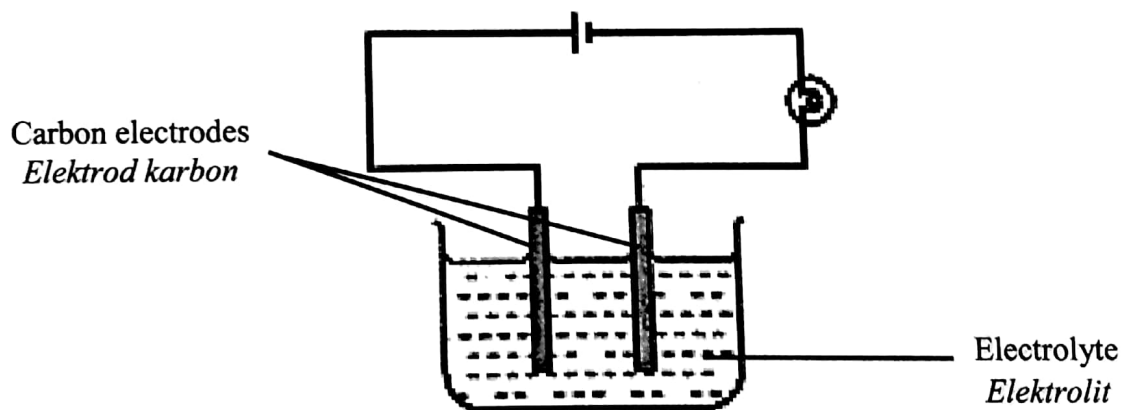


Diagram 2  
*Rajah 2*

Which substance is suitable to be used as electrolyte?  
*Bahan manakah sesuai digunakan sebagai elektrolit?*

- |  |  |
|--|--|
| A Sucrose solution<br><i>Larutan sukrosa</i>     | C Hydrochloric acid<br><i>Asid hidroklorik</i> |
| B Molten naphthalene<br><i>Leburan naftalena</i> | D Cyclohexane<br><i>Sikloheksana</i>           |

- 6 Which of the following substance has the correct chemical formula?  
*Antara bahan yang berikut, yang manakah mempunyai formula kimia yang betul?*

	Substance <i>Bahan</i>	Chemical Formula <i>Formula Kimia</i>
A	Aluminium oxide <i>Aluminium oksida</i>	$\text{Al}_2\text{O}_3$
B	Sodium chloride <i>Natrium klorida</i>	$\text{NaCl}_2$
C	Magnesium hydroxide <i>Magnesium hidroksida</i>	$\text{MgOH}_2$
D	Potassium sulphate <i>Kalium sulfat</i>	$\text{KSO}_4$

- 7 Which of the following salt can be prepared by neutralisation reaction?  
*Antara garam berikut, yang manakah dapat disediakan melalui tindak balas peneutralan?*

- |   |  |   |  |
|---|--|---|--|
| A | Sodium sulphate<br><i>Natrium sulfat</i> | C | Lead(II) chloride<br><i>Plumbum(II) klorida</i>  |
| B | Barium sulphate<br><i>Barium sulfat</i>  | D | Magnesium carbonate<br><i>Magnesium karbonat</i> |

- 8 Which of the following reaction occur at the lowest rate?  
*Antara tindak balas berikut, yang manakah berlaku pada kadar yang paling rendah?*

- A Fermentation of rice  
*Penapaian nasi*
- B Combustion of alcohol  
*Pembakaran alcohol*
- C Reaction between silver nitrate solution and sodium chloride solution  
*Tindak balas antara larutan argentum nitrat dan larutan natrium klorida*
- D Reaction between potassium chloride solution and sodium hydroxide solution  
*Tindak balas antara larutan kalium klorida dan larutan natrium hidroksida*

- 9 What is the functional group of carboxylic acid?  
*Apakah kumpulan berfungsi bagi asid karboksilik?*

- A -OH
- B  $\text{C} = \text{C}$
- C -COO-
- D -COOH

- 10 Diagram 3 shows the arrangement of atoms in bronze.  
Rajah 3 menunjukkan susunan atom dalam gangsa.

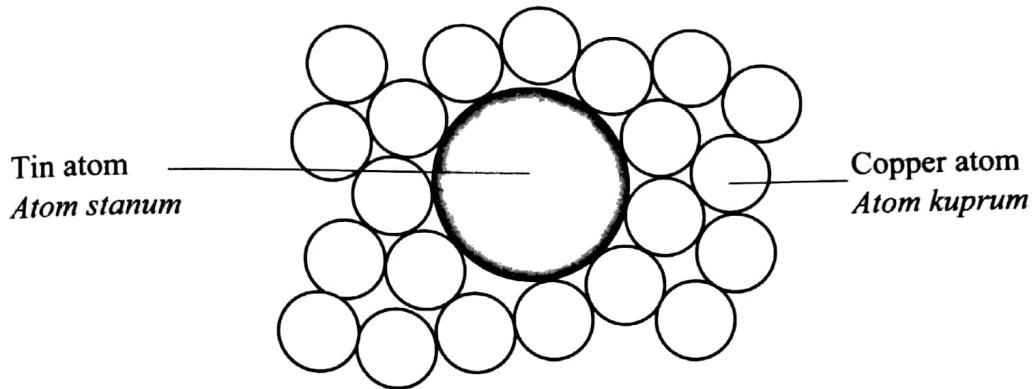
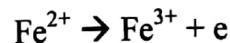


Diagram 3  
Rajah 3

What is the function of tin atom?  
Apakah fungsi atom stanum?

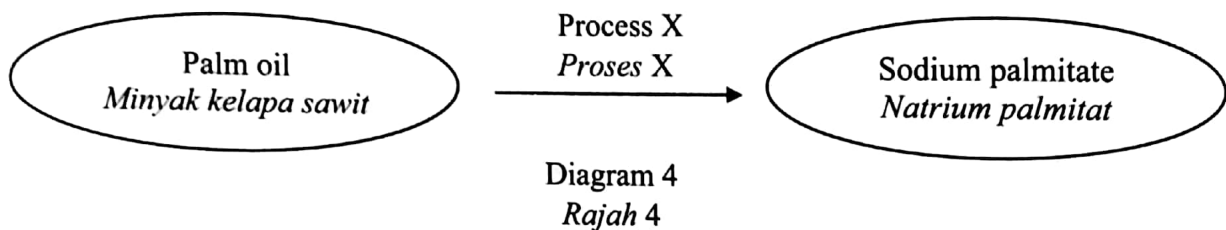
- A To put more space between copper atoms  
*Untuk menambahkan ruang antara atom-atom kuprum*
- B To prevent copper from undergoes oxidation  
*Untuk mencegah kuprum daripada mengalami pengoksidaan*
- C To strengthen the bond between copper atoms  
*Untuk menguatkan ikatan antara atom-atom kuprum*
- D To prevent the layer of copper atoms from sliding easily  
*Untuk mengurangkan lapisan atom-atom kuprum daripada menggelongsor dengan mudah*
- 11 The following half-equation shows the oxidation reaction of iron(II) sulphate solution by an oxidizing agent.  
*Setengah persamaan berikut menunjukkan tindak balas pengoksidaan larutan ferum(II) sulfat oleh agen pengoksidaan.*



Which substance is the oxidising agent?  
*Bahan manakah adalah agen pengoksidaan itu?*

- A Zinc powder  
*Serbuk zink*
- B Chlorine water  
*Air klorin*
- C Tin(II) nitrate solution  
*Larutan stanum(II) nitrat*
- D Potassium iodide solution  
*Larutan kalium iodide*

- 12 Which of the following is true about an endothermic reaction?  
*Antara yang berikut yang manakah benar tentang tindak balas endotermik?*
- A The container become hot  
*Bekas menjadi semakin panas*
  - B The value of  $\Delta H$  has negative sign  
*Nilai  $\Delta H$  mempunyai tanda negatif*
  - C The total energy content of reactants are higher than products  
*Jumlah kandungan tenaga dalam bahan tindak balas lebih tinggi daripada hasil tindak balas*
  - D Heat absorbed to break the bonds is higher than the heat release during the formation of new bond.  
*Haba yang diserap untuk memutuskan ikatan lebih tinggi daripada haba yang dibebaskan untuk membentuk ikatan baru*
- 13 Diagram 4 shows a production of sodium palmitate through process X.  
*Rajah 4 menunjukkan penghasilan natrium palmitat melalui proses X.*



What is process X?  
*Apakah proses X?*

- A Pembakaran  
*Combustion*
- B Coagulation  
*Penggumpalan*
- C Esterification  
*Pengesteran*
- D Saponification  
*Saponifikasi*

- 14 The following information describes X.  
Maklumat berikut menghuraikan X.

- Atoms of the same element  
*Atom-atom unsur yang sama*
- Have different number of neutrons  
*Mempunyai bilangan neutron berbeza*
- Have different physical properties  
*Mempunyai sifat fizik berbeza*
- Have similar chemical properties  
*Mempunyai sifat kimia yang serupa*

What is represented by X?

Apakah yang diwakili oleh X?

- |                                   |  |
|-----------------------------------|--|
| <b>A</b> Alloy<br><i>Aloi</i>     | <b>C</b> Isotopes<br><i>Isotop</i>                     |
| <b>B</b> Isomers<br><i>Isomer</i> | <b>D</b> Transition elements<br><i>Unsur peralihan</i> |
- 15 Diagram 5 shows the apparatus set-up for heating of a metal carbonate powder.  
Rajah 5 menunjukkan susunan radas bagi pemanasan serbuk logam karbonat.

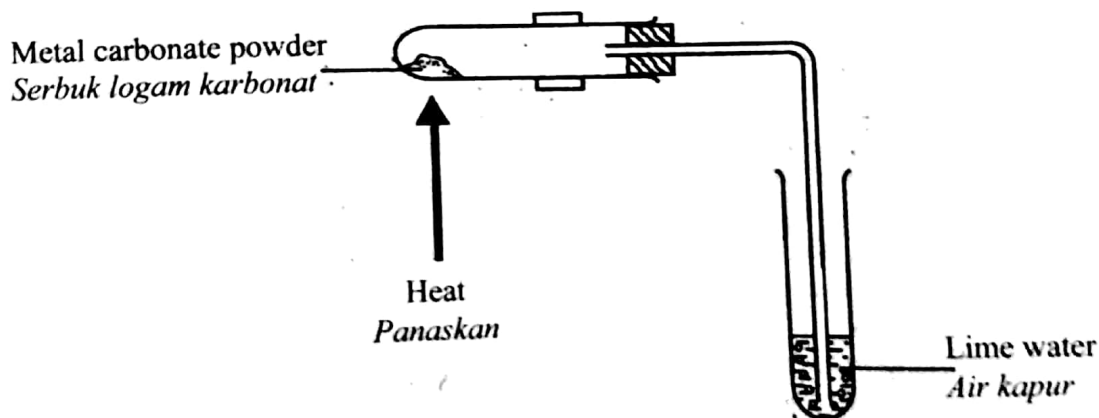


Diagram 5  
Rajah 5

The colour of the residue of this experiment is yellow when hot and white when cold.  
What is the name of the metal carbonate powder?  
Warna baki eksperimen ini adalah kuning apabila panas dan putih apabila sejuk.  
Apakah nama serbuk logam karbonat itu?

- |  |   |
|--|---|
| <b>A</b> Zinc carbonate<br><i>Zink karbonat</i>      | <b>C</b> Lead(II) carbonate<br><i>Plumbum(II) karbonat</i>  |
| <b>B</b> Sodium carbonate<br><i>Natrium karbonat</i> | <b>D</b> Copper(II) carbonate<br><i>Kuprum(II) karbonat</i> |

- 16 Which elements can form oxide with basic properties?  
*Unsur manakah boleh membentuk oksida yang bersifat bes?*

- |    |                               |     |                                 |
|----|-------------------------------|-----|---------------------------------|
| I  | Carbon<br><i>Karbon</i>       | III | Sulphur<br><i>Sulfur</i>        |
| II | Copper<br><i>Kuprum</i>       | IV  | Sodium<br><i>Natrium</i>        |
| A  | I and II<br><i>I dan II</i>   | C   | II and IV<br><i>II dan IV</i>   |
| B  | I and III<br><i>I dan III</i> | D   | III and IV<br><i>III dan IV</i> |

- 17 Diagram 6 shows the electron arrangement for the compound PQ.  
*Rajah 6 menunjukkan susunan elektron bagi sebatian PQ.*

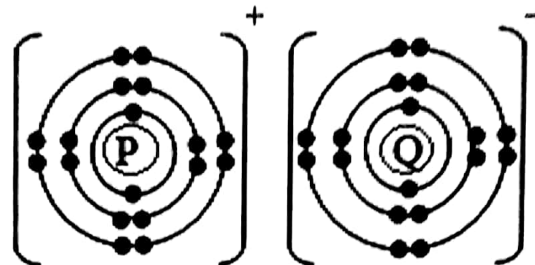


Diagram 6  
*Rajah 6*

- Which of the following statements is true about compound PQ?  
*Antara pernyataan berikut yang manakah benar mengenai sebatian PQ?*

- A Compound PQ soluble in tetrachloromethane  
*Sebatian PQ larut dalam tetraklorometana*
- B Compound PQ has high melting and boiling points  
*Sebatian PQ mempunyai takat lebur dan didih yang tinggi*
- C It is formed when atom P transfer two electrons to atom Q  
*Ianya terbentuk apabila atom P mendermakan dua elektron kepada atom Q*
- D  $P^+$  ion and  $Q^-$  ion are attracted by weak van der Waals forces  
*Ion  $P^+$  dan ion  $Q^-$  tertarik oleh daya van der Waals yang lemah*



- 18 Diagram 7 shows a simple voltaic cell.  
Rajah 7 menunjukkan satu sel kimia ringkas.

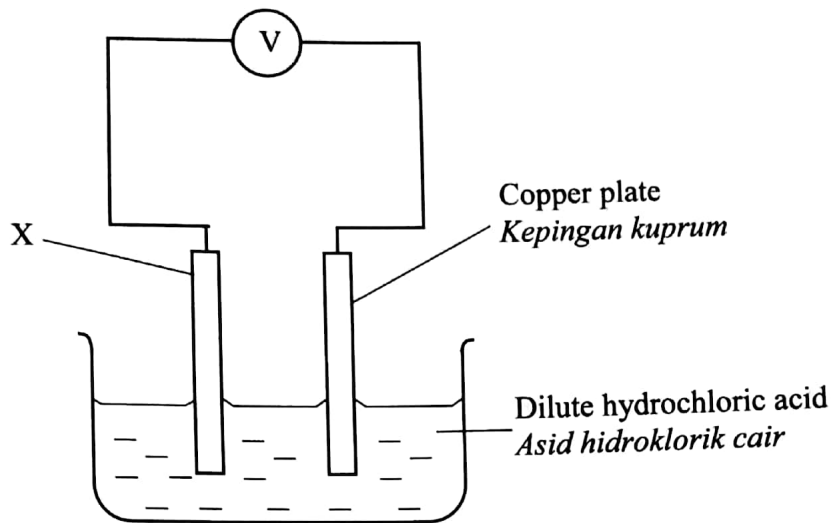


Diagram 7  
Rajah 7

Which of the following will produce the lowest voltmeter reading?  
Antara berikut, yang manakah akan menghasilkan bacaan voltmeter paling rendah?

- A Magnesium  
*Magnesium*
- B Aluminium  
*Aluminium*
- C Silver  
*Argentum*
- D Iron  
*Ferum*
- 19 Which of the following statement is true?  
Antara pernyataan berikut yang manakah adalah benar?
- A All metals react with acid  
*Semua logam bertindak balas dengan asid*
- B Some metal oxides react with acid  
*Sesetengah oksida logam bertindak balas dengan asid*
- C All metal carbonates react with acid  
*Semua karbonat logam bertindak balas dengan asid*
- D Some metal oxides produce carbon dioxide gas when react with acid  
*Sesetengah oksida logam menghasilkan gas karbon dioksida apabila bertindak balas dengan asid*

**SULIT**

- 20 Which of the following salt solution **does not** form precipitate when added to zinc sulphate solution?  
 Antara larutan garam berikut yang manakah **tidak** menghasilkan mendakan apabila ditambah kepada larutan zink sulfat?

- A Lead(II) nitrate solution  
*Larutan plumbum(II) nitrat*
- B Sodium carbonate solution  
*Larutan natrium karbonat*
- C Calcium hydroxide solution  
*Larutan kalsium hidroksida*
- D Ammonium chloride solution  
*Larutan ammonium klorida*

- 21 Diagram 8 shows a badminton racket.  
 Rajah 8 menunjukkan raket badminton.

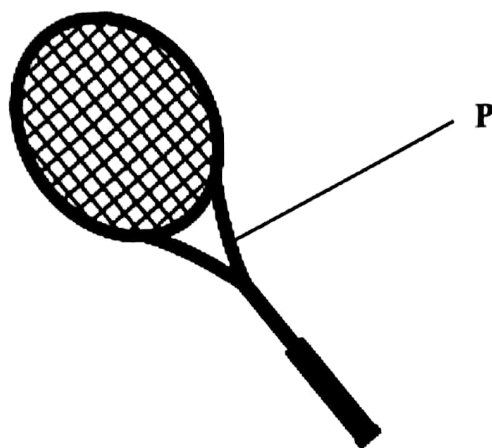


Diagram 8  
 Rajah 8

- Which of the following material is used to make part P?  
 Antara bahan yang berikut, yang manakah digunakan untuk membuat bahagian P?

- A Ceramics  
*Seramik*
- B Polythene  
*Politena*
- C Fibre glass  
*Gentian kaca*
- D Fibre optic  
*Gentian optik*

- 22 Table 1 shows the reactants and the condition of Experiment I and II.  
*Jadual 1 menunjukkan bahan tindak balas dan keadaan tindak balas bagi Eksperimen I dan II.*

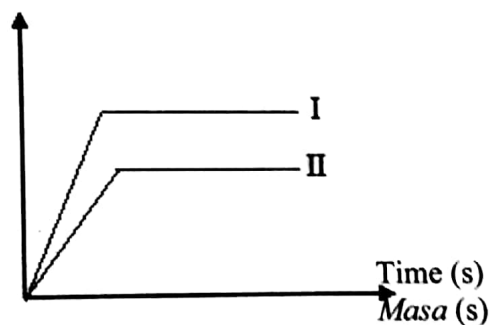
Experiment <i>Eksperimen</i>	Reactants <i>Bahan tindak balas</i>	Temperature <i>Suhu</i>
I	Excess calcium carbonate granule + 50 cm <sup>3</sup> of 1.0 mol dm <sup>-3</sup> hydrochloric acid <i>Serbuk zink berlebihan + 50 cm<sup>3</sup> asid hidroklorik 1.0 mol dm<sup>-3</sup></i>	Room temperature <i>Suhu bilik</i>
II	Excess calcium carbonate granule + 100 cm <sup>3</sup> of 0.5 mol dm <sup>-3</sup> hydrochloric acid <i>Serbuk zink berlebihan + 100 cm<sup>3</sup> asid hidroklorik 0.5 mol dm<sup>-3</sup></i>	Room temperature <i>Suhu bilik</i>

Table 1  
*Jadual 1*

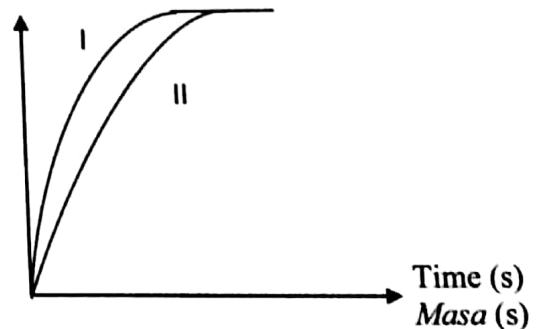
Which graph represents the reactions?

*Graf yang manakah mewakili tindak balas-tindak balas tersebut?*

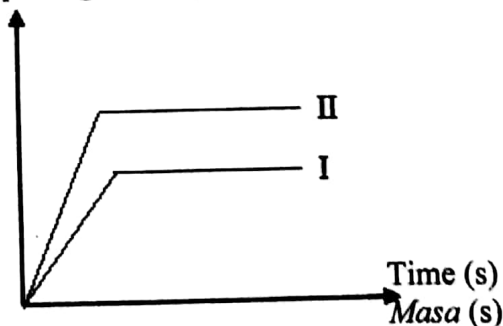
A Volume of gas (cm<sup>3</sup>)  
*Isipadu gas (cm<sup>3</sup>)*



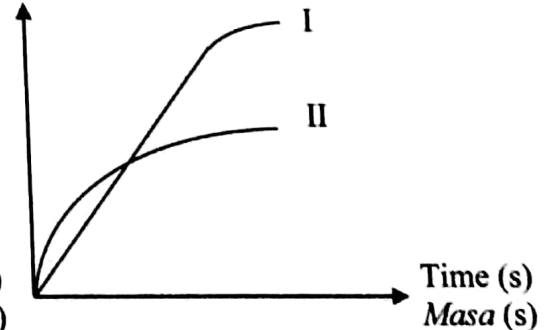
C Volume of gas (cm<sup>3</sup>)  
*Isipadu gas (cm<sup>3</sup>)*



B Volume of gas (cm<sup>3</sup>)  
*Isipadu gas (cm<sup>3</sup>)*



D Volume of gas (cm<sup>3</sup>)  
*Isipadu gas (cm<sup>3</sup>)*



- 23 Diagram 9 shows the structural formula of a carbon compound.  
Rajah 9 menunjukkan formula struktur bagi satu sebatian karbon.

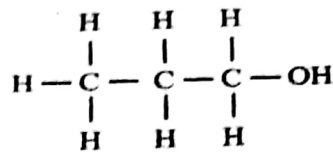


Diagram 9

Rajah 9

Which of the following are the physical properties of the carbon compound?  
Antara berikut, yang manakah merupakan sifat-sifat fizik bagi sebatian karbon itu?

- |   |  |
|---|--|
| I Soluble in water<br><i>Larut di dalam air</i>                 | III Has sweet smell<br><i>Mempunyai bau wangi</i>                                |
| II Burns with blue flame<br><i>Terbakar dengan nyalaan biru</i> | IV Exists as gas at room temperature<br><i>Wujud sebagai gas pada suhu bilik</i> |
| A I and II<br><i>I dan II</i>                                   | C II and IV<br><i>II dan IV</i>  |
| B I and III<br><i>I dan III</i>                                 | D III and IV<br><i>III dan IV</i>  |
- 24 Ores are reduced to extract metals by different ways due to their difference in reactivity.  
Which of the following ores can be reduced by carbon?  
*Bijih-bijih diturunkan untuk mengekstrak logam dengan cara yang berbeza disebabkan oleh kereaktifan yang berbeza.*  
*Antara bijih yang berikut, yang manakah boleh diturunkan oleh karbon?*
- A Iron(II) oxide  
*Ferum(II) oksida*
- B Aluminium oxide  
*Aluminium oksida*
- C Calcium carbonate  
*Kalsium karbonat*
- D Magnesium carbonate  
*Magnesium karbonat*
- 25 Which of the following is **not** true about heat of displacement?  
*Manakah antara berikut **tidak** benar mengenai haba penyesanan?*
- A Heat is released during the reaction  
*Haba dibebaskan semasa tindak balas*
- B Metal is displaced from its salt solution  
*Logam disesarkan daripada larutan garamnya*
- C The temperature of the solution increases  
*Suhu larutan meningkat*
- D The metal displaced is more electropositive  
*Logam yang disesarkan adalah lebih elektropositif*

- 26 Diagram 8 shows a picture of a medicine.  
Rajah 8 menunjukkan gambar sejenis ubat.



Diagram 10  
Rajah 10

Which of the following is true about this medicine?  
Antara yang berikut, yang manakah benar mengenai ubat ini?

- A This medicine can reduce depression  
*Ubat ini boleh mengurangkan kemurungan*
- B This medicine can cause drowsiness  
*Ubat ini boleh menyebabkan mengantuk*
- C This medicine is used to treat viral infection  
*Ubat ini digunakan untuk mengubati jangkitan virus*
- D This medicine is a chemical that can destroy bacteria  
*Ubat ini adalah bahan kimia yang dapat memusnahkan bakteria*
- 27 Diagram 11 shows Process X.  
Rajah 11 menunjukkan Proses X.

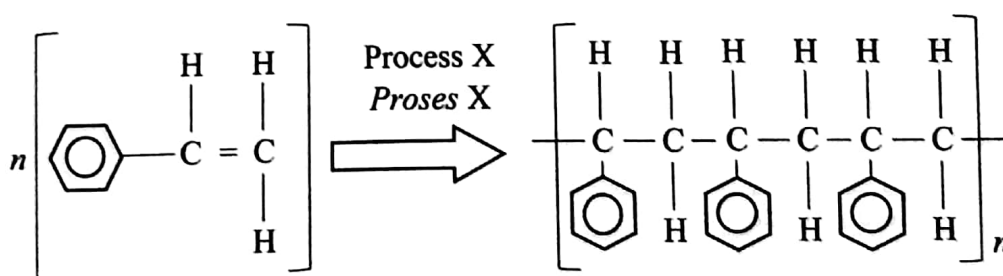


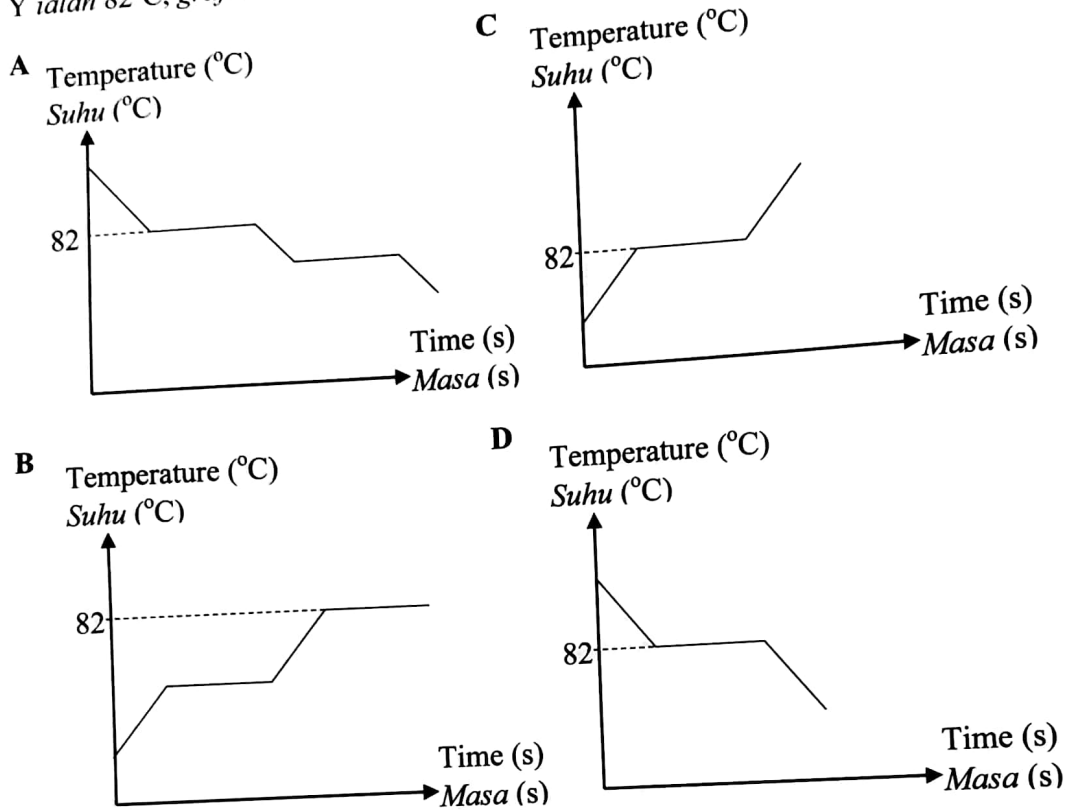
Diagram 11  
Rajah 11

What is process X?  
Apakah proses X?

- |   |  |
|---|--|
| A Esterification<br><i>Pengesteran</i>  | C Hydrogenation<br><i>Penghidrogenan</i> |
| B Polymerisation<br><i>Pempolimeran</i> | D Oxidation<br><i>Pengoksidaan</i>       |

SULIT

- 28 Liquid Y is cooled and the temperature is recorded at regular time intervals. If the freezing point of Y is  $82^{\circ}\text{C}$ , which graph represents the cooling curve of Y?  
*Cecair Y disejukkan dan suhu direkodkan pada sela masa yang sekata. Jika takat beku Y ialah  $82^{\circ}\text{C}$ , graf manakah yang mewakili lengkung penyejukan bagi Y?*



- 29 A farmer found that the soil of his farm is too acidic to plant vegetables. As a chemistry student, which substances will you suggest to the farmer to overcome his problem?  
*Seorang petani mendapati tanah di kebunnya terlalu berasid untuk menanam sayur. Sebagai seorang pelajar kimia, bahan-bahan manakah yang akan anda cadangkan kepada petani tersebut untuk mengatasi masalahnya?*

- |    |   |     |  |
|----|---|-----|--|
| I  | Calcium oxide<br><i>Kalsium oksida</i>        | III | Magnesium carbonate<br><i>Magnesium karbonat</i> |
| II | Sodium hydroxide<br><i>Natrium hidroksida</i> | IV  | Ammonia aqueous<br><i>Akueus ammonia</i>         |
| A  | I and II only<br><i>I dan II sahaja</i>       | C   | II and IV only<br><i>II dan IV sahaja</i>        |
| B  | I and III only<br><i>I dan III sahaja</i>     | D   | III and IV only<br><i>III dan IV sahaja</i>      |

- 30 Table 2 shows the elements S, T and U with their respective electron arrangements. S, T and U are not the actual symbol of the element.  
 Jadual 2 menunjukkan unsur-unsur S, T dan U dengan susunan elektron masing-masing.  
 S, T dan U bukan simbol sebenar unsur.

Element <i>Unsur</i>	Electron arrangement <i>Susunan electron</i>
S	2.8.7
T	2.8.3
U	2.8.1

Table 2  
 Jadual 2

Which of the following is true about element S, T and U?  
 Antara yang berikut, yang manakah benar tentang unsur S, T dan U?

- A Oxide of T has acidic properties  
*Oksida T bersifat asid*
- B Element S dissolves in water to form alkaline solution  
*Unsur S larut di dalam air membentuk larutan beralkali*
- C The element U is known as the alkaline earth metal  
*Unsur U dikenali sebagai logam alkali bumi*
- D The size of the atom becomes bigger in the order of S, T and U  
*Saiz atom semakin besar dalam turutan S, T dan U*
- 31 Which of the following explains the increase of rate of reaction between sodium thiosulphate and sulphuric acid when the experiment is carried out at a higher temperature?  
 Antara berikut yang manakah menerangkan pertambahan kadar tindak balas antara natrium tiosulfat dan asid sulfurik apabila eksperimen dijalankan pada suhu yang lebih tinggi?
- A Activation energy decreases  
*Tenaga pengaktifan dikurangkan*
- B Frequency of collision decreases  
*Frekuensi perlanggaran berkurang*
- C Kinetic energy of reactant's particle increases  
*Tenaga kinetik zarah bahan tindak balas meningkat*
- D Number of particles per unit volume increases  
*Bilangan zarah per unit isipadu meningkat*

- 32 Diagram 12 shows the electron arrangement of a chemical compound.  
Rajah 12 menunjukkan susunan elektron bagi satu sebatian kimia.

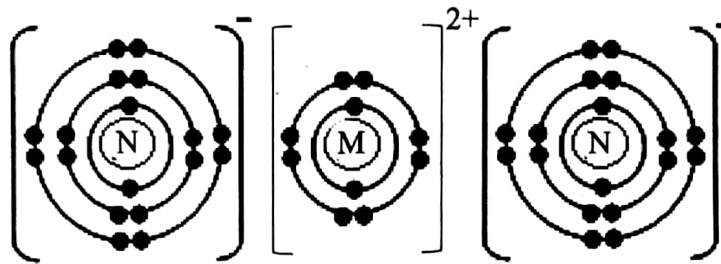


Diagram 12  
Rajah 12

What are the elements represented by N and M?

[Proton number: F = 9, Na = 11, Mg = 12, Cl = 17]

Apakah unsur yang diwakili oleh N dan M?

[Nombor proton: F = 9, Na = 11, Mg = 12, Cl = 17]

	N	M
A	Chlorine <i>Klorin</i>	Sodium <i>Natrium</i>
B	Chlorine <i>Klorin</i>	Magnesium <i>Magnesium</i>
C	Fluorine <i>Fluorin</i>	Sodium <i>Natrium</i>
D	Fluorine <i>Fluorin</i>	Magnesium <i>Magnesium</i>

- 33 Solid Q produces a brown gas that turns moist blue litmus paper red when heated strongly.

What is solid Q?

Pepejal Q menghasilkan gas perang yang menukar kertas litmus biru lembap kepada merah apabila dipanaskan dengan kuat.

Apakah pepejal Q?

- |   |   |   |  |
|---|---|---|--|
| A | Lead(II) nitrate<br><i>Plumbum(II) nitrat</i> | C | Zinc sulphate<br><i>Zink sulfat</i>                |
| B | Calcium chloride<br><i>Kalsium klorida</i>    | D | Copper(II) carbonate<br><i>Kuprum(II) karbonat</i> |



- 34 Diagram 13 shows the apparatus set-up for electroplating of metal.  
Rajah 13 menunjukkan susunan radas untuk penyaduran logam.

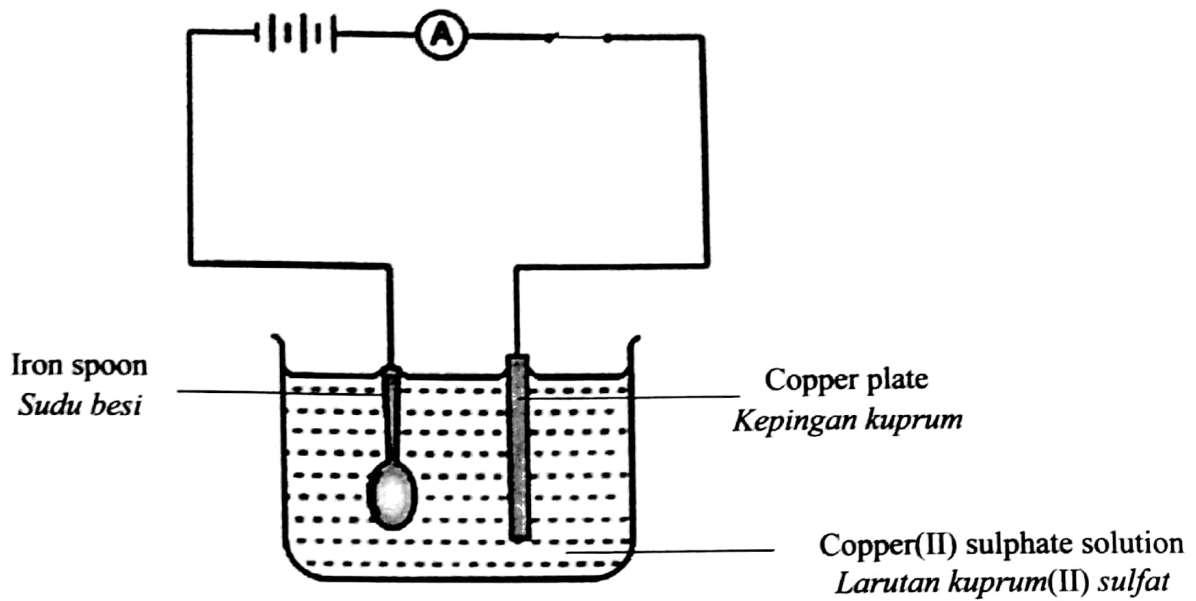


Diagram 13  
Rajah 13

Which of the following shows observation at anode and cathode?  
Antara berikut yang manakah menunjukkan pemerhatian di anod dan katod?

	<b>Anode</b> <i>Anod</i>	<b>Cathode</b> <i>Katod</i>
A	Copper plate becomes thinner <i>Kepingan kuprum semakin nipis</i>	Brown solid is deposited on spoon <i>Pepejal perang terenap pada sudu</i>
B	Copper plate becomes thinner <i>Kepingan kuprum semakin nipis</i>	Iron spoon becomes shiny <i>Sudu besi lebih bersinar</i>
C	Iron spoon becomes thinner <i>Sudu besi menipis</i>	Copper plate becomes thicker <i>Kepingan kuprum semakin tebal</i>
D	Colourless gas bubbles formed <i>Gelembung gas tidak berwarna terhasil</i>	Brown solid is deposited on spoon <i>Pepejal perang terenap pada sudu</i>

- 35 Diagram 14 shows chemical compositions of alloy X which is used to make railway track.

*Rajah 14 menunjukkan komposisi kimia bagi aloi X yang digunakan untuk membuat landasan keretapi.*

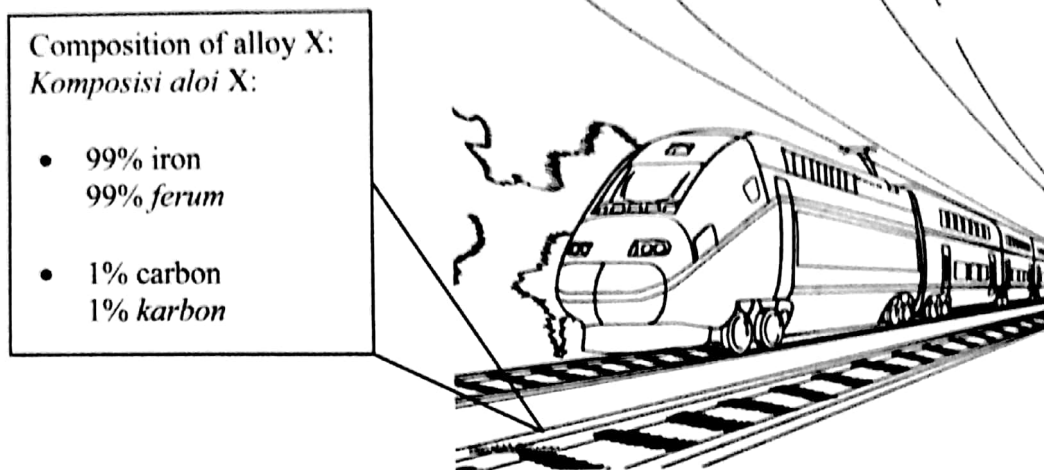


Diagram 14  
*Rajah 14*

What is alloy X?  
*Apakah aloi X?*

- A Steel  
*Keluli*
- B Brass  
Loyang
- C Duralumin  
*Duralumin*
- D Stainless steel  
*Keluli nirkarat*
- 36 The following information is about hydrocarbon X.  
*Maklumat berikut adalah mengenai hidrokarbon X.*

- Contains 5 carbon atoms  
*Mengandungi 5 atom karbon*
- Saturated hydrocarbon  
*Hidrokarbon tepu*

Which of the following is the molecular formula of hydrocarbon X?  
*Antara yang berikut, yang manakah adalah formula molekul hidrokarbon X?*

- A  $C_5H_{10}$                       C  $C_5H_{11}OH$
- B  $C_5H_{12}$                         D  $C_4H_9COOH$

- 37 When copper is added to silver nitrate solution,  $\text{AgNO}_3$ , copper will displace silver from the solution.  
Which are the half equations that represent the oxidation and reduction reactions occurred?

*Apabila kuprum ditambah ke dalam larutan argentum nitrat,  $\text{AgNO}_3$  kuprum akan menyesar argentum daripada larutan tersebut.*

*Setengah persamaan manakah yang mewakili tindak balas pengoksidaan dan penurunan yang berlaku?*

	<b>Oxidation Pengoksidaan</b>	<b>Reduction Penurunan</b>
A	$\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}$	$\text{Ag}^+ + \text{e} \rightarrow \text{Ag}$
B	$\text{Cu}^{2+} + 2\text{e} \rightarrow \text{Cu}$	$\text{Ag} \rightarrow \text{Ag}^+ + \text{e}$
C	$\text{Ag}^+ + \text{e} \rightarrow \text{Ag}$	$\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}$
D	$\text{Ag} \rightarrow \text{Ag}^+ + \text{e}$	$\text{Cu}^{2+} + 2\text{e} \rightarrow \text{Cu}$

- 38 Table 3 shows the heat of combustion of alcohols.  
*Jadual 3 menunjukkan haba pembakaran alkohol.*

<b>Molecular formula of alcohol Formula molekul alkohol</b>	<b>Heat of combustion (<math>\text{kJ mol}^{-1}</math>) Haba pembakaran (<math>\text{kJ mol}^{-1}</math>)</b>
$\text{CH}_3\text{OH}$	-715
$\text{C}_2\text{H}_5\text{OH}$	-1371
$\text{C}_3\text{H}_7\text{OH}$	-2010
$\text{C}_4\text{H}_9\text{OH}$	-2673

Table 3  
Jadual 3

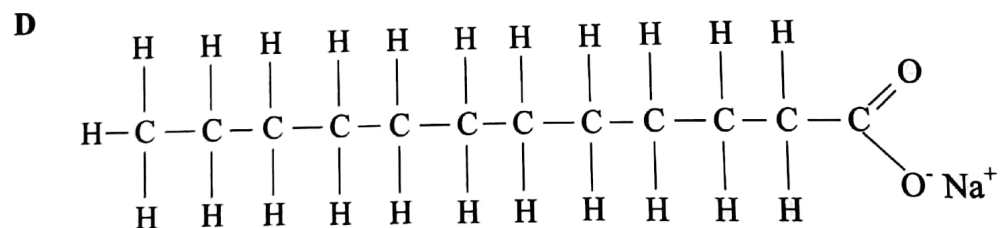
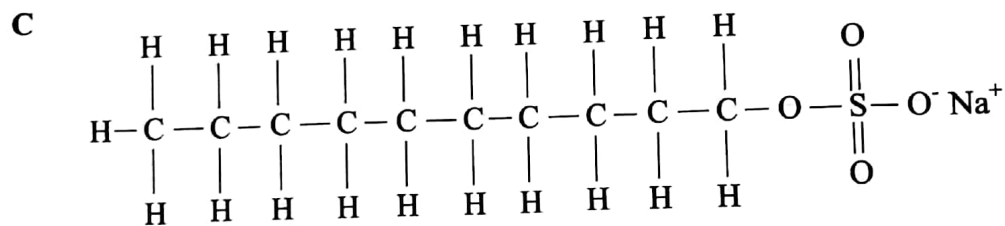
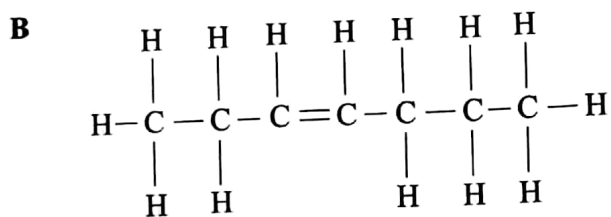
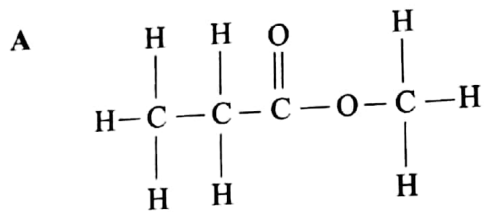
What is the amount of heat energy released during the combustion of 5.0 g of ethanol?  
[Relative atomic mass : H = 1, C = 12, O = 16]  
*Apakah jumlah tenaga haba yang dibebaskan semasa pembakaran 5.0 g etanol?  
[Jisim atom relatif : H = 1, C = 12, O = 16]*

- A 57.0 kJ  
B 108.2 kJ  
C 137.1 kJ  
D 149.0 kJ

SULIT

39 Mrs. Fatimah and her family live near the beach. One day she washes clothes using sea water.

Which of the following substances is suitable for washing the clothes more effectively?  
 Puan Fatimah dan keluarganya tinggal berhampiran pantai. Pada suatu hari, beliau mencuci pakaian menggunakan air laut.  
 Antara bahan berikut, yang manakah sesuai digunakan untuk mencuci pakaian dengan lebih berkesan?



- 40 Diagram 15 shows the representation of atom for element Q.  
*Rajah 15 menunjukkan perwakilan atom bagi unsur Q.*

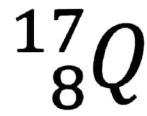
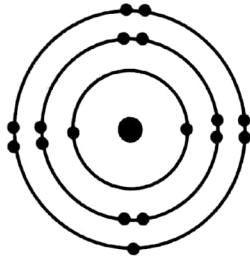


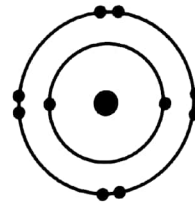
Diagram 15  
*Rajah 15*

Which of the following is the electron arrangement of atom Q?  
*Antara berikut, yang manakah adalah susunan elektron bagi atom Q?*

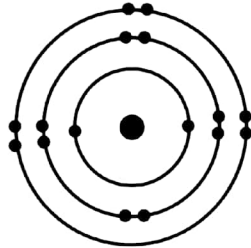
A



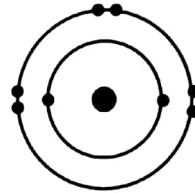
C



B



D



- 41 Diagram 16 shows the conversation between two students while carrying out an experiment.  
*Rajah 16 menunjukkan perbualan antara dua orang murid semasa menjalankan satu eksperimen.*

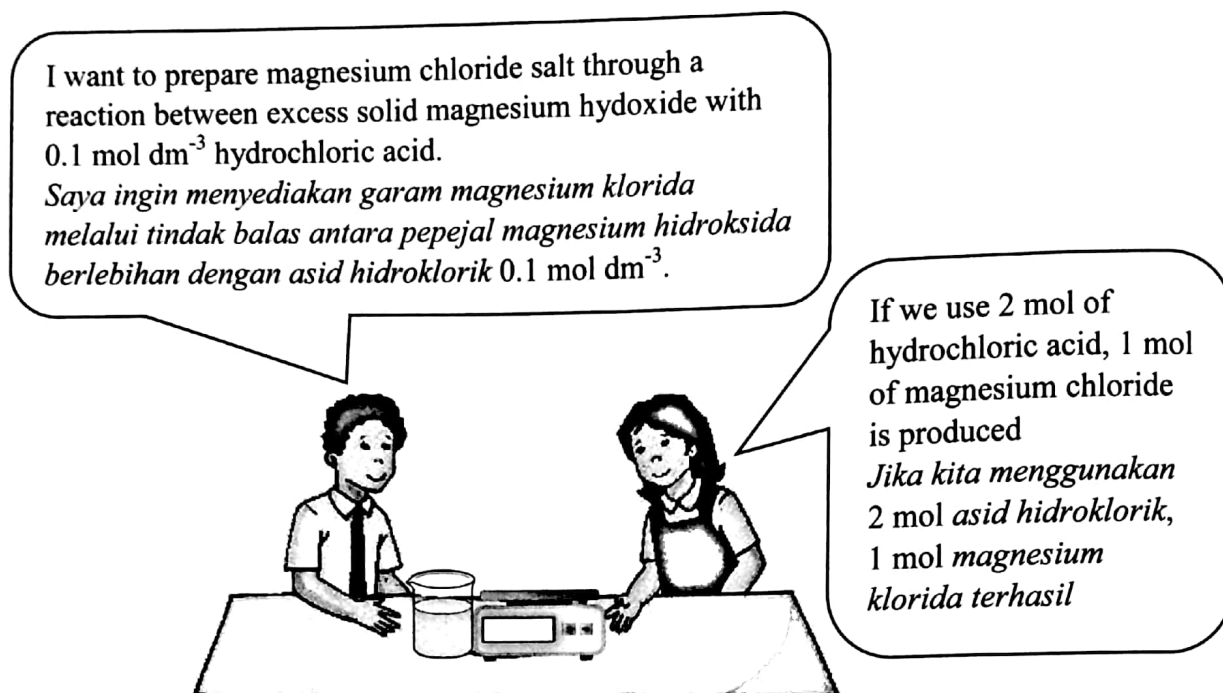


Diagram 16  
 Rajah 16

What is the volume of acid needed to prepare 0.95 g magnesium chloride?

[Relative atomic mass: Mg = 24, Cl = 35.5]

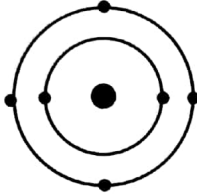
*Berapakah isipadu asid yang diperlukan untuk menyediakan 0.95 g magnesium klorida?*

[*Jisim atom relatif: Mg = 24, Cl = 35.5*]

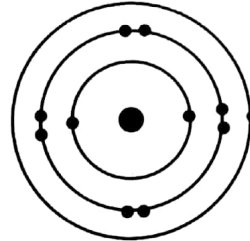
- |   |                     |   |                     |
|---|---------------------|---|---------------------|
| A | 0.1 dm <sup>3</sup> | C | 1.0 dm <sup>3</sup> |
| B | 0.2 dm <sup>3</sup> | D | 2.0 dm <sup>3</sup> |

- 42 An element X has the same chemical property as the element with the proton number 9. The letter X is not the actual symbol of the element. Which of the following is the electron arrangement of element X?  
 Satu unsur X mempunyai sifat kimia yang sama dengan unsur yang mempunyai nombor proton 9. Huruf X bukan simbol sebenar unsur itu. Antara yang berikut, yang manakah ialah susunan elektron unsur X?

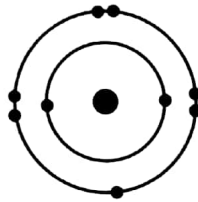
A



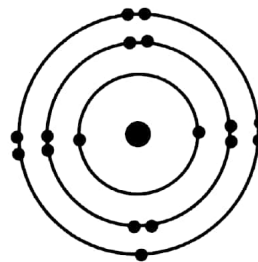
C



B



D



- 43 Table 4 shows the number of electrons of atom X and atom Y.  
 Jadual 4 menunjukkan bilangan elektron yang terdapat di dalam atom X dan atom Y.

Atom <i>Atom</i>	Number of electron <i>Bilangan electron</i>
X	8
Y	6

Table 4  
 Jadual 4

What is the chemical formula of the compound formed when X reacts with Y?  
 Apakah formula kimia sebatian yang terbentuk apabila X bertindak balas dengan Y?

- A  $XY_2$   
 B  $YX_2$   
 C  $X_2Y$   
 D  $Y_2X$

- 44 Diagram 17 shows the process of aluminium extraction in industry.  
Rajah 17 menunjukkan proses pengekstrakan aluminium dalam industri.

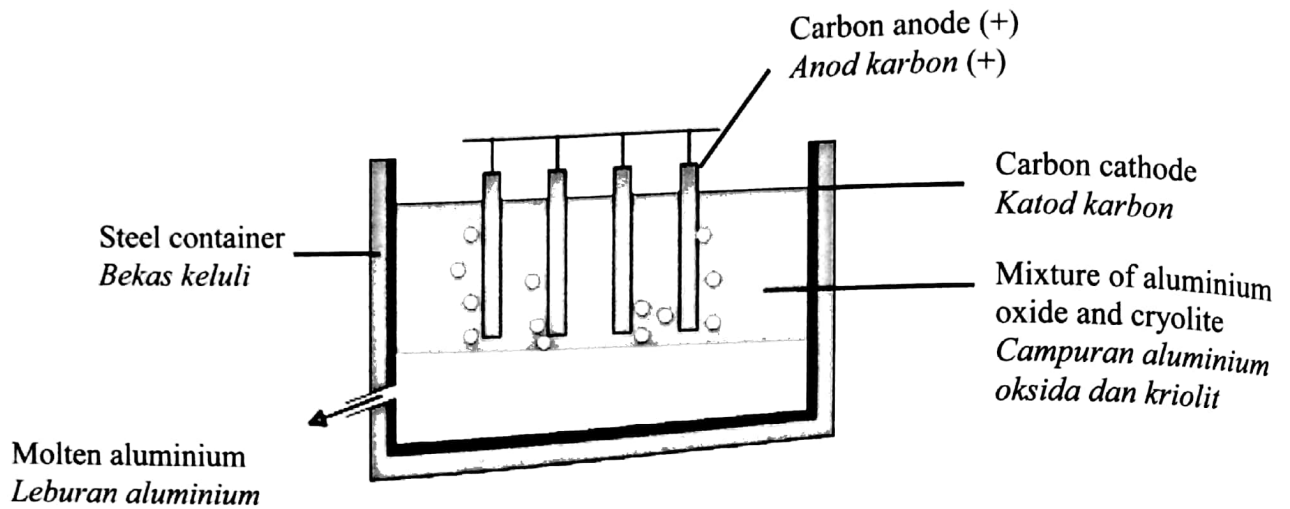


Diagram 17  
Rajah 17

72 000 dm<sup>3</sup> oxygen gas is produced during the electrolysis of aluminium oxide.

What is the number of aluminium atoms produced?

[Molar volume of gas at room temperature and pressure: 24 dm<sup>3</sup> mol<sup>-1</sup>; Avogadro constant = 6.02 x 10<sup>23</sup> mol<sup>-1</sup>]

72 000 dm<sup>3</sup> gas oksigen terhasil dalam elektrolisis aluminium oksida.

Berapakah bilangan atom aluminium yang terhasil?

[Isipadu molar gas pada suhu dan tekanan bilik: 24 dm<sup>3</sup> mol<sup>-1</sup>; Pemalar Avogadro = 6.02 x 10<sup>23</sup> mol<sup>-1</sup>]

A 1.2040 x 10<sup>27</sup>  
B 1.3545 x 10<sup>27</sup>

C 1.8060 x 10<sup>27</sup>  
D 2.4080 x 10<sup>27</sup>

- 45 A chemistry student wants to prepare 250 cm<sup>3</sup> of 1.0 mol dm<sup>-3</sup> copper(II) sulphate solution.

What is the mass of solid copper(II) sulphate needed?

[Relative atomic mass: Cu = 64, S = 32, O = 16]

Seorang pelajar kimia ingin menyediakan 250 cm<sup>3</sup> larutan kuprum(II) sulfat 1.0 mol dm<sup>-3</sup>.

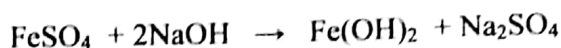
Berapakah jisim pepejal kuprum(II) sulfat yang diperlukan?  
[Jisim atom relatif: Cu = 64, S = 32, O = 16]

A 28.0 g  
B 40.0 g

C 56.0 g  
D 64.0 g



- 46 The chemical equation below shows the reaction between iron(II) sulphate solution and sodium hydroxide solution.  
*Persamaan kimia berikut menunjukkan tindak balas antara larutan ferum(II) sulfat dan larutan natrium hidroksida.*



What is the concentration of 20 cm<sup>3</sup> sodium hydroxide solution that produces 0.225 g of iron(II) hydroxide?

[Relative atomic mass: H = 1, O = 16, Fe = 56]

*Berapakah kepekatan 20 cm<sup>3</sup> larutan natrium hidroksida yang menghasilkan 0.225 g ferum(II) hidroksida?*

[Jisim atom relatif: H = 1, O = 16, Fe = 56]

- |   |                            |   |                            |
|---|----------------------------|---|----------------------------|
| A | 0.063 mol dm <sup>-3</sup> | C | 0.200 mol dm <sup>-3</sup> |
| B | 0.125 mol dm <sup>-3</sup> | D | 0.250 mol dm <sup>-3</sup> |

- 47 Table 5 shows the total volume of hydrogen gas, H<sub>2</sub> collected in the reaction between zinc and dilute hydrochloric, HCl.

*Jadual 5 menunjukkan jumlah isi padu gas hidrogen, H<sub>2</sub> yang dikumpulkan dalam tindak balas antara zink dan asid hidroklorik cair, HCl.*

Time (s) Masa (s)	0	30	60	90	120	150	180	210	240
Volume of H <sub>2</sub> (cm <sup>3</sup> ) Isi padu H <sub>2</sub> (cm <sup>3</sup> )	0.0	18.0	27.5	35.0	41.5	46.5	50.0	50.0	50.0

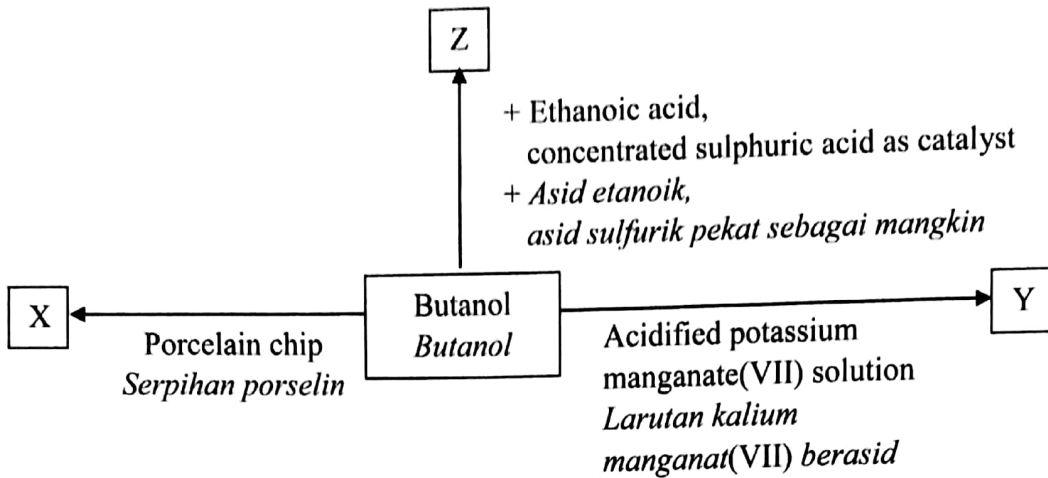
Table 5  
Jadual 5

What is the average rate of reaction in the third minute?

*Berapakah kadar tindak balas purata di dalam minit ketiga?*

- |   |   |
|---|---|
| A | 0.14 cm <sup>3</sup> min <sup>-1</sup>  |
| B | 0.28 cm <sup>3</sup> min <sup>-1</sup>  |
| C | 8.50 cm <sup>3</sup> min <sup>-1</sup>  |
| D | 16.70 cm <sup>3</sup> min <sup>-1</sup> |

- 48 Diagram 18 shows several reactions involving butanol.  
Rajah 18 menunjukkan beberapa tindak balas melibatkan butanol.

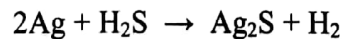


Which of the following are compound X, Y and Z?

Antara yang berikut, yang manakah antara berikut sebatian X, Y dan Z?

	<b>Compound X</b> <i>Sebatian X</i>	<b>Compound Y</b> <i>Sebatian Y</i>	<b>Compound Z</b> <i>Sebatian Z</i>
<b>A</b>	Butane <i>Butana</i>	Butene <i>Butena</i>	Butyl butanoate <i>Butil butanoat</i>
<b>B</b>	Butene <i>Butena</i>	Butanoic acid <i>Asid butanoik</i>	Ethyl butanoate <i>Etil butanoat</i>
<b>C</b>	Butene <i>Butena</i>	Butanoic acid <i>Asid butanoik</i>	Butyl ethanoate <i>Butil etanoat</i>
<b>D</b>	Butanoic acid <i>Asid butanoik</i>	Butene <i>Butena</i>	Butyl ethanoate <i>Butil etanoat</i>

- 49 A redox reaction can be represented by the following equation.  
Satu tindak balas redoks boleh diwakili oleh persamaan berikut.



What are the change in oxidation number of silver and hydrogen in this reaction?

Apakah perubahan nombor pengoksidaan argentum dan hidrogen dalam tindak balas ini?

	<b>Silver</b> <i>Argentum</i>	<b>Hydrogen</b> <i>Hidrogen</i>
<b>A</b>	0 → +1	+1 → 0
<b>B</b>	0 → +2	+1 → 0
<b>C</b>	+1 → 0	0 → +1
<b>D</b>	0 → +2	0 → +1

- 50 Table 6 shows the information from an experiment to determine the heat of combustion of butanol.

*Jadual 6 menunjukkan maklumat daripada satu eksperimen untuk menentukan haba pembakaran butanol.*

Volume of water in the copper can (cm <sup>3</sup> ) <i>Isi padu air dalam bekas kuprum (cm<sup>3</sup>)</i>	200
Initial temperature of water (°C) <i>Suhu awal air (°C)</i>	27.5
Highest temperature of water (°C) <i>Suhu tertinggi air (°C)</i>	69.5

Table 6  
*Jadual 6*

Heat of combustion of butanol is  $-2679 \text{ kJ mol}^{-1}$ .

What is the mass of butanol burnt in this reaction?

[Specific heat capacity of water =  $4.2 \text{ Jg}^{-1}\text{C}^{-1}$ ; water density =  $1 \text{ g cm}^{-3}$ ]

[Relative atomic mass: H = 1, C = 12 and O = 16]

*Haba pembakaran butanol adalah  $-2679 \text{ kJ mol}^{-1}$ .*

*Berapakah jisim butanol yang telah terbakar dalam tindak balas ini?*

*[Muatan haba tentu air =  $4.2 \text{ Jg}^{-1}\text{C}^{-1}$ ; ketumpatan air =  $1 \text{ g cm}^{-3}$ ]*

*[Jisim atom relatif: H = 1, C = 12 dan O = 16]*

- A 0.816 g
- B 0.975 g
- C 4.708 g
- D 5.619 g

**END OF QUESTION PAPER**  
***KERTAS SOALAN TAMAT***