

CONFIDENTIAL
4541/1
Chemistry
Paper 1
September
2015
1 ¼ hours



SIJIL PENDIDIKAN
MAKTAB RENDAH SAINS MARA
2015

CHEMISTRY

Paper 1

One hour and fifteen minutes

DO NOT OPEN THE QUESTION BOOKLET
UNTIL BEING TOLD TO DO SO

- 1 This question booklet is bilingual.
Kertas soalan ini adalah dalam dwibahasa.
- 2 Candidates are required to read the information at the last page of this question booklet.
Calon dikehendaki membaca maklumat di halaman belakang kertas soalan.

This question booklet contains 32 printed pages.
Buku soalan ini mengandungi 32 halaman bercetak.

- 1 Which of the following exists as atom only?
Antara berikut, yang manakah wujud sebagai atom sahaja?

- A Helium
Helium
- B Glucose
Glukosa
- C Nitrogen
Nitrogen
- D Magnesium oxide
Magnesium oksida

2

Barium sulphate is used in carrying out colonoscopy
X-ray to detect bowel cancer.

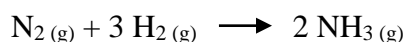
*Barium sulfat digunakan dalam X-ray kolonoskopi bagi
menganalisis kanser usus.*

- What is the chemical formula of barium sulphate?
Apakah formula kimia bagi barium sulfat?

- A BaSO_4
- B BaSO_3
- C BaS_2O_3
- D $\text{Ba}(\text{OH})_2$
- 3 Which of the following ions present in the copper(II) sulphate solution?
Antara ion-ion berikut, yang manakah terdapat dalam larutan kuprum(II) sulfat?
- A Cu^{2+} , SO_4^{2-} , H^+ and OH^- ions
Ion Cu^{2+} , SO_4^{2-} , H^+ dan OH^-
- B Cu^{2+} and SO_4^{2-} ions
Ion Cu^{2+} dan SO_4^{2-}
- C H^+ and OH^- ions
Ion H^+ dan OH^-
- D Cu^{2+} and H^+ ions
Ion Cu^{2+} dan H^+

- 4 The following reaction occurs in Haber Process:

Tindak balas berikut berlaku dalam Proses Haber:



What is the optimum condition of this reaction?

Apakah keadaan optimum bagi tindak balas tersebut?

	Temperature (°C) <i>Suhu (°C)</i>	Pressure (atm) <i>Tekanan (atm)</i>	Catalyst <i>Mangkin</i>
A	800	3	Platinum <i>Platinum</i>
B	180	1	Nickel <i>Nikel</i>
C	450	1	Vanadium(V) oxide <i>Vanadium(V) oksida</i>
D	450	200	Iron <i>Ferum</i>

- 5 Water molecules consist of hydrogen and oxygen atoms.

Which of the following is the best statement to describe why the boiling point of water is low?

Molekul air terdiri daripada atom hidrogen dan oksigen.

Antara pernyataan berikut, yang manakah terbaik untuk menerangkan mengapa takat didih air adalah rendah?

- A A lot of heat energy is needed to overcome the ionic bond between ions
Banyak tenaga haba diperlukan untuk mengatasi ikatan ion antara ion
- B Less heat energy is needed to overcome the covalent bond between atoms
Kurang tenaga haba diperlukan untuk mengatasi ikatan kovalen antara atom
- C Less heat energy is needed to overcome the forces of attraction between molecules
Kurang tenaga haba diperlukan untuk mengatasi daya tarikan antara molekul
- D A lot of heat energy is needed to overcome the ionic and covalent bonding between atoms
Banyak tenaga haba diperlukan untuk mengatasi ikatan ion dan kovalen antara atom

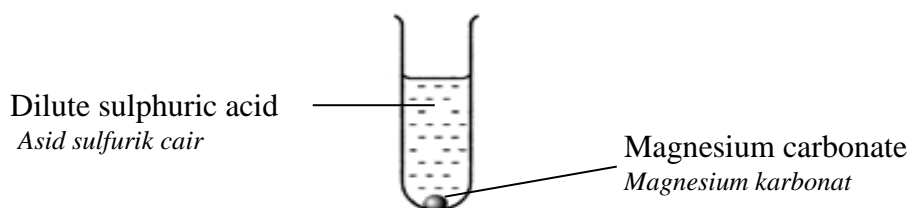
- 6 The following information shows the uses of process K.
Maklumat berikut menunjukkan kegunaan proses K.

- | | |
|---|--|
| <ul style="list-style-type: none"> • Prevent corrosion
<i>Mencegah kakisan</i> | <ul style="list-style-type: none"> • Improve the appearance
<i>Memperbaiki rupa</i> |
|---|--|

What is process K?

Apakah proses K?

- A** Purification
Penulenan
- B** Extraction
Pengekstrakan
- C** Wrapping
Pembungkusan
- D** Electroplating
Penyaduran
- 7 Diagram 1 shows the apparatus set-up to determine the chemical properties of sulphuric acid.
Rajah 1 menunjukkan susunan radas untuk menentukan sifat kimia asid sulfurik.



Which of the following are the products of the reaction?

Antara berikut, yang manakah merupakan hasil tindak balas itu?

- A** Magnesium sulphate and water
Magnesium sulfat dan air
- B** Magnesium sulphate and hydrogen gas
Magnesium sulfat dan gas hidrogen
- C** Magnesium sulphate, water and hydrogen gas
Magnesium sulfat, air dan gas hidrogen
- D** Magnesium sulphate, water and carbon dioxide gas
Magnesium sulfat, air dan gas karbon dioksida

- 8 Table 1 shows the list of acids for substances P, Q, R and S.
Jadual 1 menunjukkan senarai asid bagi bahan-bahan P, Q, R dan S.

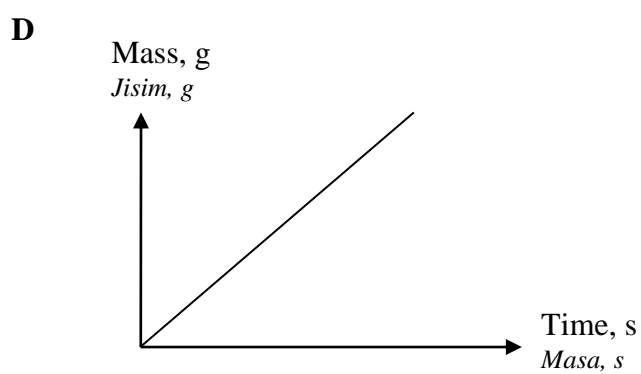
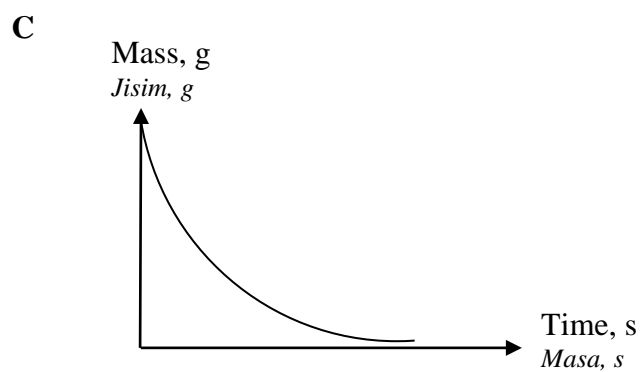
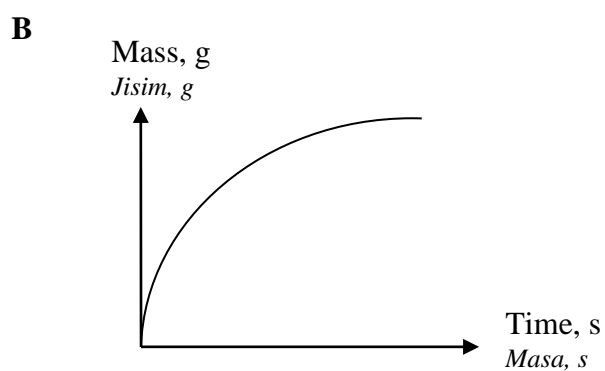
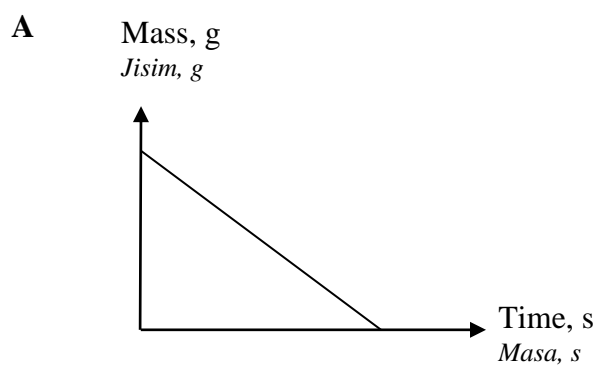
Substance <i>Bahan</i>	Name <i>Nama</i>
P	Hydrochloric acid <i>Asid hidroklorik</i>
Q	Sulphuric acid <i>Asid sulfurik</i>
R	Ethanoic acid <i>Asid etanoik</i>
S	Nitric acid <i>Asid nitrik</i>

Table 1
Jadual 1

- Which of the following are monoprotic acid?
Antara berikut, yang manakah asid monoprotik?
- A P and Q
P dan Q
- B Q and R
Q dan R
- C P, R and S
P, R dan S
- D P, Q, R and S
P, Q, R dan S
- 9 Which of the following is not suitable to be used in the preparation of copper(II) nitrate salt?
Antara berikut, yang manakah tidak sesuai digunakan dalam penyediaan garam kuprum(II) nitrat?
- A Copper and dilute nitric acid
Kuprum dan asid nitrik cair
- B Copper(II) oxide and dilute nitric acid
Kuprum(II) oksida dan asid nitrik cair
- C Copper(II) carbonate and dilute nitric acid
Kuprum(II) karbonat dan asid nitrik cair
- D Copper(II) hydroxide and dilute nitric acid
Kuprum(II) hidroksida dan asid nitrik cair

- 10** Which statement is true about groups in the Periodic Table of Elements?
Antara pernyataan berikut, yang manakah benar berkaitan kumpulan dalam Jadual Berkala Unsur?
- A** Each group contains both metals and non-metals
Setiap kumpulan mengandungi kedua-dua logam dan bukan logam
 - B** Atoms of elements in the same group have the same number of protons
Atom-atom bagi unsur-unsur dalam kumpulan yang sama memiliki bilangan proton yang sama
 - C** In Group 1, reactivity decreases with increasing proton number
Dalam Kumpulan 1, kereaktifan menurun dengan pertambahan nombor proton
 - D** In Group 17, the melting point of the elements increases with increasing proton number
Dalam Kumpulan 17, takat lebur unsur meningkat dengan pertambahan nombor proton
- 11** Why is silver chloride added in photochromic glass?
Mengapa argentum klorida ditambah ke dalam kaca fotokromik?
- A** To make it lighter
Menjadikannya lebih ringan
 - B** To make it stronger
Menjadikannya lebih kuat
 - C** To make it less fragile
Menjadikannya tidak mudah pecah
 - D** To make it sensitive to light
Menjadikannya peka terhadap cahaya
- 12** What are the products for complete combustion of ethane?
Apakah hasil tindakbalas bagi pembakaran lengkap etana?
- A** Carbon and water
Karbon dan air
 - B** Carbon dioxide and water
Karbon dioksida dan air
 - C** Carbon monoxide and water
Karbon monoksida dan air
 - D** Carbon dioxide, carbon and water
Karbon dioksida, karbon dan air

- 13 Which graph correctly shows the change of mass of reactant against time?
Graf manakah yang betul menunjukkan perubahan jisim bahan tindak balas melawan masa?



- 14 Diagram 2 shows the reaction of propene.
Rajah 2 menunjukkan tindak balas propena.

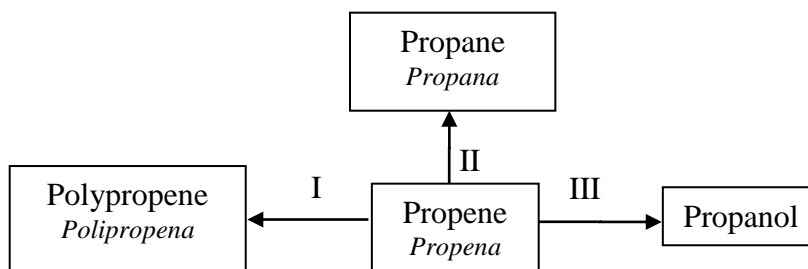


Diagram 2
Rajah 2

- Name the reaction I, II and III.
Namakan tindak balas I, II dan III.

	I	II	III
A	Polymerization <i>Pempolimeran</i>	Halogenation <i>Penghalogenan</i>	Hydration <i>Penghidratan</i>
B	Hydrogenation <i>Penghidrogenan</i>	Halogenation <i>Penghalogenan</i>	Oxidation <i>Pengoksidaan</i>
C	Polymerization <i>Pempolimeran</i>	Hydrogenation <i>Penghidrogenan</i>	Hydration <i>Penghidratan</i>
D	Halogenation <i>Penghalogenan</i>	Hydrogenation <i>Penghidrogenan</i>	Oxidation <i>Pengoksidaan</i>

- 15 Which of the following is a reduction process?
Antara berikut, yang manakah proses penurunan?

- A Increase in oxidation number
Peningkatan nombor pengoksidaan
- B Gain of oxygen
Menerima oksigen
- C Loss of hydrogen
Kehilangan hidrogen
- D Gain of electron
Menerima elektron

- 16** Which substance can be used to convert Fe^{2+} ions to Fe^{3+} ions in an aqueous solution?
Bahan manakah boleh digunakan untuk menukar ion Fe^{2+} kepada ion Fe^{3+} di dalam larutan akueus?
- A** Magnesium strip
Kepingan magnesium
- B** Sulphur dioxide gas
Gas sulfur dioksida
- C** Potassium iodide solution
Larutan kalium iodida
- D** Acidified potassium dichromate(VI) solution
Larutan kalium dikromat(VI) berasid
- 17** Which of the chemical reaction releases heat to the surrounding?
Tindak balas kimia yang manakah membebaskan haba ke persekitaran?
- A** Dissolving potassium nitrate in water
Melarutkan kalium nitrat di dalam air
- B** Dissolving ammonium sulphate in water
Melarutkan ammonium sulfat di dalam air
- C** Adding sodium hydroxide to nitric acid
Menambahkan natrium hidroksida kepada asid nitrik
- D** Adding potassium hydrogen carbonate to hydrochloric acid
Menambahkan kalium hidrogen karbonat kepada asid hidroklorik
- 18** Which of the following medicine is an antibiotic?
Antara ubat berikut, yang manakah merupakan antibiotik?
- A** Insulin
Insulin
- B** Codeine
Kodeina
- C** Streptomycin
Streptomisin
- D** Aspirin
Aspirin

- 19 Diagram 3 shows the energy level diagram of a chemical reaction between substance X and water.
Rajah 3 menunjukkan gambar rajah aras tenaga bagi tindak balas antara bahan X dan air.

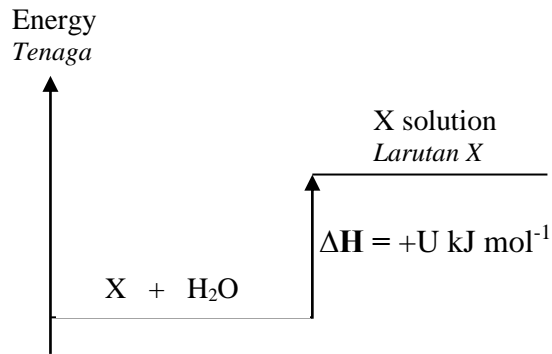


Diagram 3
Rajah 3

What is substance X?
Apakah bahan X?

- A Ammonium nitrate
Ammonium nitrat
 - B Potassium hydroxide
Kalium hidroksida
 - C Sodium metal
Logam natrium
 - D Concentrated hydrochloric acid
Asid hidroklorik pekat
- 20 Which ion forms scum when added to soap solution?
Ion manakah membentuk kekat apabila ditambah kepada larutan sabun?
- A K^+
 - B Ca^{2+}
 - C Zn^{2+}
 - D Al^{3+}

- 21 Diagram 4 shows the symbol of element T.
Rajah 4 menunjukkan simbol bagi unsur T.

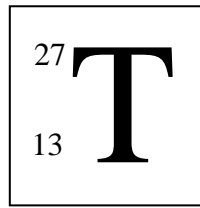


Diagram 4
Rajah 4

Which of the following is true about element T?
Antara berikut, yang manakah benar mengenai unsur T?

	Proton number <i>Nombor proton</i>	Nucleon number <i>Nombor nukleon</i>	Electron arrangement <i>Susunan elektron</i>
A	13	27	2.8.3
B	13	14	2.8.4
C	27	13	2.8.3
D	27	14	2.8.4

- 22 Element Y can react with oxygen to form a compound with formula YO.

What is the formula of the compound formed when element Y reacts with chlorine?

[Proton number: O=8, Cl=17]

Unsur Y bertindak balas dengan oksigen untuk membentuk sebatian dengan formula YO.

Apakah formula sebatian yang terbentuk apabila unsur Y bertindak balas dengan klorin?

[Nombor proton: O=8, Cl=17]

- A** YCl
- B** YCl₂
- C** Y₂Cl
- D** Y₂Cl₃

- 23 Table 2 shows the electron arrangement of atom S, T, U and V.
Jadual 2 menunjukkan susunan elektron bagi atom S, T, U dan V.

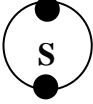
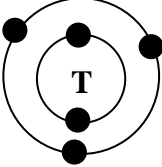
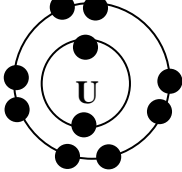
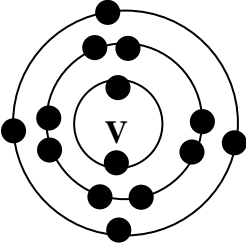
Atom <i>Atom</i>	Electron arrangement <i>Susunan elektron</i>
S	
T	
U	
V	

Table 2
Jadual 2

Which atoms belong to Group 18?

Antara atom-atom berikut, yang manakah dari Kumpulan 18?

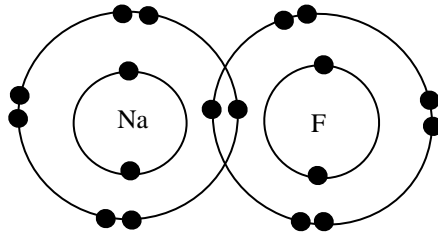
- A** U only
U sahaja
- B** S and U
S dan U
- C** T and V
T dan V
- D** S, T and V
S, T dan V

- 24 Which of the following represents the electron arrangement for the compound sodium fluoride, NaF?
[Proton number: F=9, Na=11]

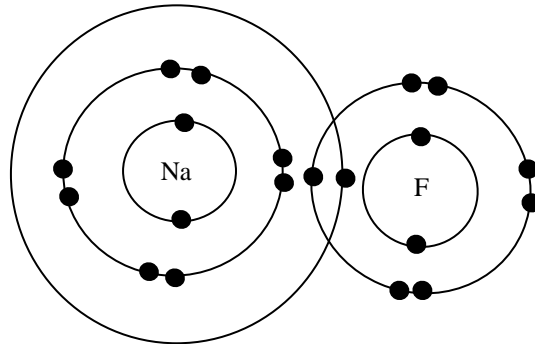
Antara berikut, yang manakah menunjukkan susunan elektron bagi sebatian natrium florida, NaF?

[Nombor Proton: F=9, Na=11]

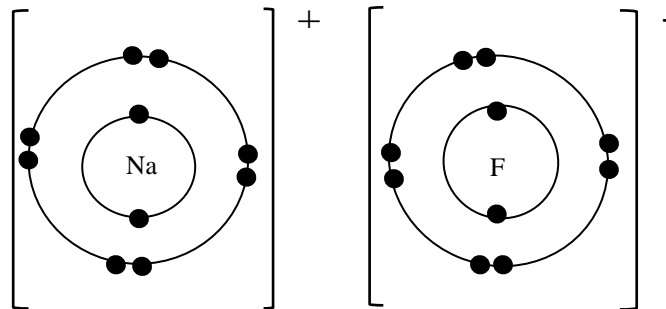
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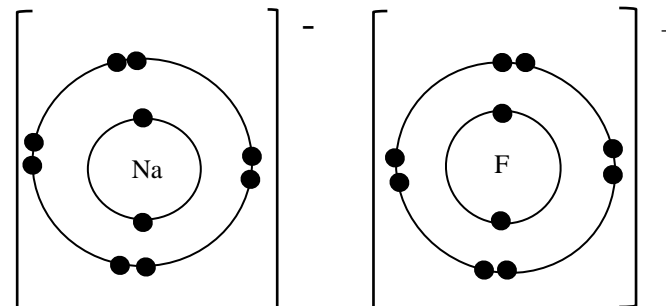
B



C



D



- 25 Diagram 5 shows the apparatus set-up for electrolysis of $0.001 \text{ mol dm}^{-3}$ hydrochloric acid.
Rajah 5 menunjukkan susunan radas bagi elektrolisis larutan asid hidroklorik $0.001 \text{ mol dm}^{-3}$.

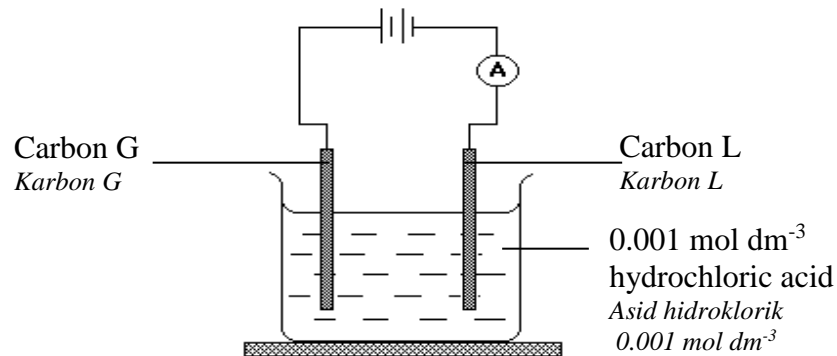
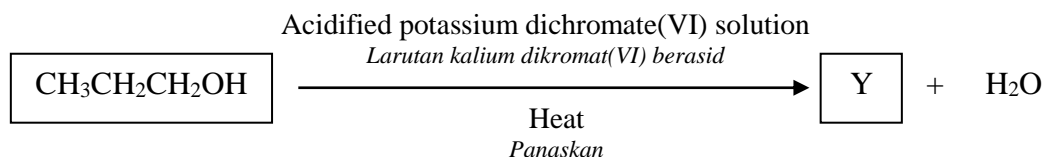


Diagram 5
Rajah 5

What is formed at carbon G?
Apakah yang terbentuk di karbon G?

- A Chlorine gas
Gas klorin
- B Oxygen gas
Gas oksigen
- C Hydrogen gas
Gas hidrogen
- D Hydrogen chloride gas
Gas hidrogen klorida
- 26 The following equation represents a chemical reaction of an organic compound.
Persamaan berikut mewakili tindak balas kimia bagi suatu sebatian organik.



What is the suitable chemical used to verify substance Y?
Apakah bahan kimia yang sesuai digunakan untuk menentusahkan bahan Y?

- A Tetrachloromethane
Tetraklorometana
- B Bromine water
Air bromin
- C Marble chips
Ketulan marmar
- D Lime water
Air kapur

- 27 Diagram 6 shows dry hydrogen chloride gas is passed through dilute ammonia solution which was added with three drops of phenolphthalein.
Rajah 6 menunjukkan gas hidrogen klorida kering dialirkan melalui larutan ammonia akueus cair yang telah ditambah dengan tiga titik fenolftalein.

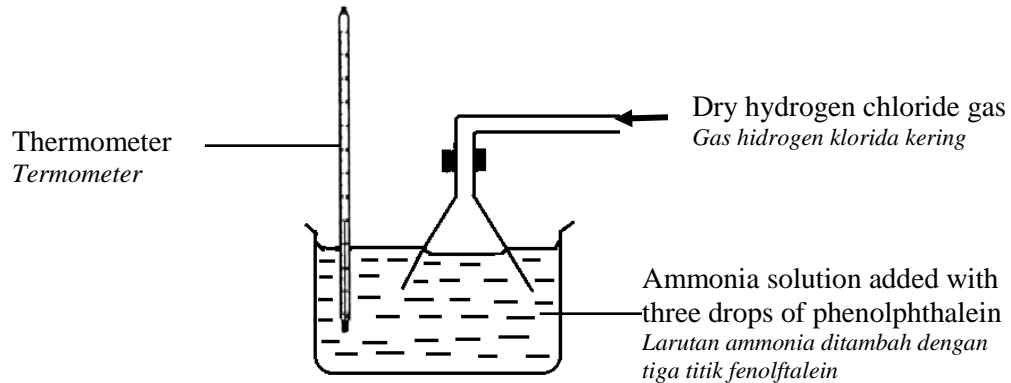


Diagram 6
Rajah 6

- Which of the following is true?
Antara berikut, yang manakah benar?
- A** The colourless solution turns pink
Larutan tak berwarna bertukar ke merah jambu
- B** White precipitate forms
Mendakan putih terbentuk
- C** Temperature of the solution increases
Suhu larutan meningkat
- D** pH of solution increases
pH larutan bertambah
- 28 What is the oxidation number of chromium in $\text{Cr}_2\text{O}_7^{2-}$ ion and Cr_2O_3 ?
Apakah nombor pengoksidaan bagi kromium dalam ion $\text{Cr}_2\text{O}_7^{2-}$ dan Cr_2O_3 ?
- A** -3 and +6
-3 dan +6
- B** +6 and +3
+6 dan +3
- C** +6 and +2
+6 dan +2
- D** -6 and -3
-6 dan -3

- 29 Diagram 7 shows the pH value of the soil in parts W and X of a palm oil plantation.
Rajah 7 menunjukkan nilai pH bagi tanah di bahagian W dan X di ladang kelapa sawit.

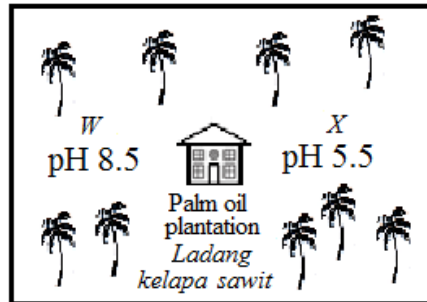


Diagram 7
Rajah 7

Encik Ali wants to neutralise the soil in his plantation.
Which of the following should be added to each part?

Encik Ali ingin meneutralkan tanah di ladangnya.

Antara berikut, yang manakah perlu ditambah kepada setiap bahagian?

	W	X
A	Compost <i>Kompos</i>	Soda lime <i>Kapur tohor</i>
B	Vinegar <i>Cuka</i>	Salt <i>Garam</i>
C	Soda lime <i>Kapur tohor</i>	Compost <i>Kompos</i>
D	Fertiliser <i>Baja</i>	Compost <i>Kompos</i>

- 30 Diagram 8 shows a ceramic pot.
Rajah 8 menunjukkan periuk seramik.



Diagram 8
Rajah 8

Which is the most suitable property of ceramic in this application?
Ciri seramik manakah yang paling sesuai dalam aplikasi ini?

- A Ceramics are hard but brittle
Seramik keras tetapi rapuh
- B Ceramics can withstand high pressure
Seramik tahan tekanan tinggi
- C Ceramics are inert to chemicals and retains heat
Seramik lengai terhadap bahan kimia dan mengekalkan haba
- D Ceramics are good conductor of electricity and heat
Seramik ialah pengalir elektrik dan haba yang baik

- 31 Diagram 9 shows the apparatus set-up to prepare lead(II) carbonate salt .
Rajah 9 menunjukkan susunan radas bagi menyediakan garam plumbum(II) karbonat.

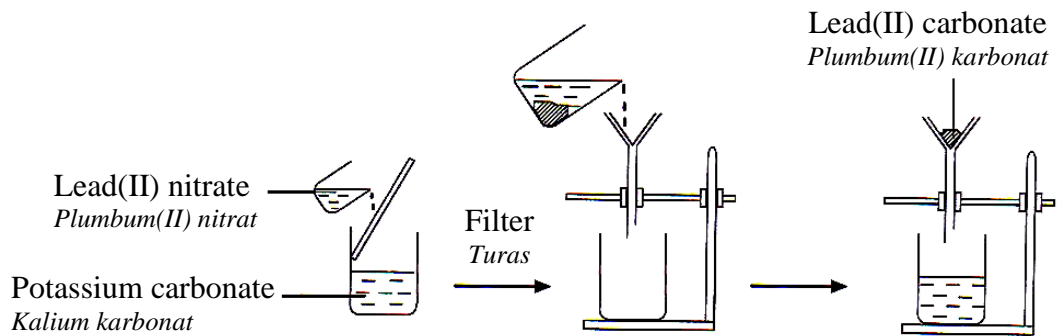


Diagram 9
Rajah 9

Which of the following substance can replace potassium carbonate to obtain the same salt?

Antara bahan berikut, yang manakah dapat menggantikan kalium karbonat untuk mendapatkan garam yang sama?

- A Ammonium carbonate
Ammonium karbonat
- B Zinc carbonate
Zink karbonat
- C Aluminium carbonate
Aluminium karbonat
- D Magnesium carbonate
Magnesium karbonat
- 32 Substance E will prolong the freshness of food and retain its nutrient by reducing the effects of oxygen on food. Substance E is also beneficial to human health.
Bahan E akan memanjangkan tempoh kesegaran dan mengekalkan kandungan nutrien makanan dengan mengurangkan tindakan oksigen ke atas makanan. Bahan E juga memberi manfaat kepada kesihatan manusia.

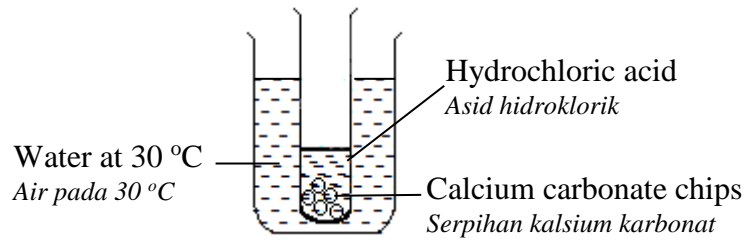
Which of the following is substance E?

Antara berikut manakah bahan E?

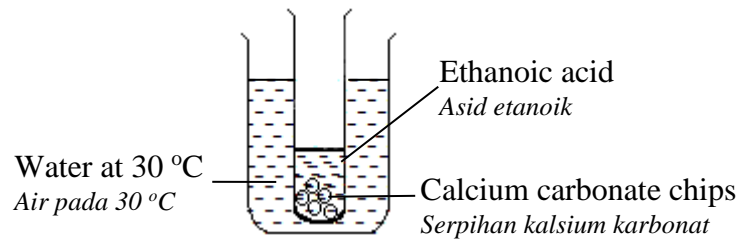
- A Butylated hydroxyanisole (BHA)
Butylated hydroxyanisole (BHA)
- B Sodium chloride
Natrium klorida
- C Ethanoic acid
Asid etanoik
- D Ascorbic acid
Asid askorbik

- 33 Which reaction is the fastest?
Tindak balas yang manakah paling cepat?

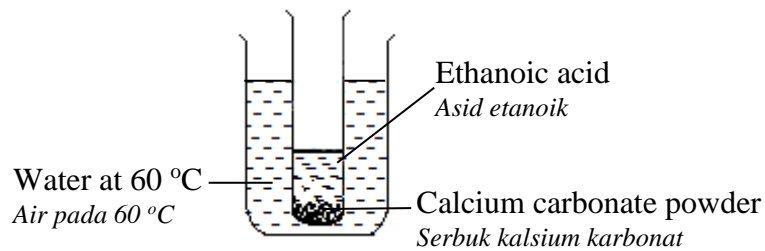
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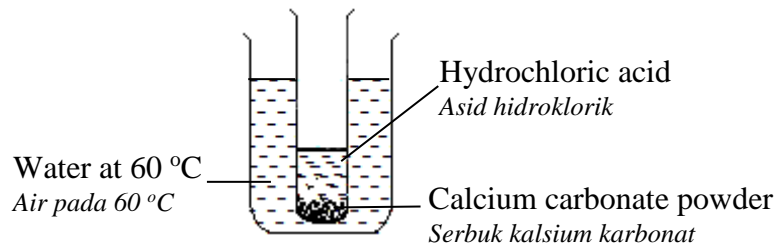
B



C



D



- 34 Diagram 10 shows the structural formula of carbon compound Z.
Rajah 10 menunjukkan formula struktur sebatian karbon Z.

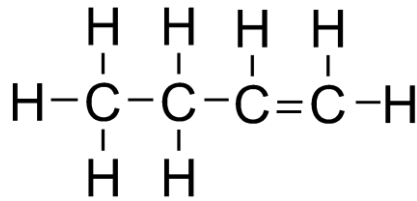


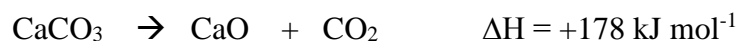
Diagram 10
Rajah 10

Which of the following statements are true?
Antara pernyataan berikut, yang manakah benar?

- I Empirical formula of compound Z is C₄H₈
Formula empirik sebatian Z ialah C₄H₈
- II Name of the compound Z is but-1-ene
Nama sebatian Z ialah but-1-ena
- III Oxidation of compound Z produce butan-1,2-diol
Pengoksidaan sebatian Z menghasilkan butan-1,2-diol
- IV One of the isomers of compound Z is 2-methylpropene
Salah satu isomer bagi sebatian Z ialah 2-metilpropena
- A I and III
I dan III
- B II and IV
II dan IV
- C II, III and IV
II, III dan IV
- D I, II, III and IV
I, II, III dan IV

- 35 The following thermochemical equation shows the decomposition of calcium carbonate.

Persamaan termokimia berikut menunjukkan penguraian kalsium karbonat.



What happens in this reaction?

Apakah yang berlaku dalam tindak balas ini?

- A** Energy is absorbed more during the formation of bonds than energy released during the breaking of bonds
Lebih banyak tenaga haba diserap semasa pembentukan ikatan berbanding tenaga yang dibebaskan untuk memutuskan ikatan
- B** Energy is released more during the formation of bonds than energy absorbed during the breaking of bonds
Lebih banyak tenaga haba dibebaskan semasa pembentukan ikatan berbanding tenaga yang diserap untuk memutuskan ikatan
- C** The quantity of heat released to the surrounding during reaction is 178 kJ
Kuantiti haba yang dibebaskan ke persekitaran semasa tindak balas ialah 178 kJ
- D** Total energy content of calcium carbonate is lower than total energy content of calcium oxide and carbon dioxide
Jumlah kandungan tenaga kalsium karbonat lebih rendah daripada jumlah kandungan tenaga kalsium oksida dan karbon dioksida
- 36 0.05 mol of diatomic molecule gas J has a mass of 1.4 g.
0.05 mol gas molekul dwiatom J mempunyai jisim 1.4 g.

What is the relative atomic mass of element J?

Apakah jisim atom relatif bagi unsur J?

- A** 7
- B** 14
- C** 28
- D** 40

- 37** When copper(II) carbonate is heated, it decomposes to copper(II) oxide and carbon dioxide gas.

If 4.80 dm^3 of carbon dioxide gas produced, what is the mass of copper(II) carbonate used?

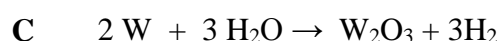
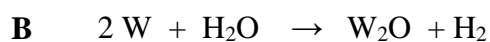
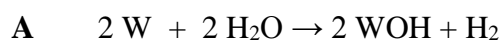
[Relative atomic mass: C=12, O=16, Cu=64; 1 mole of a gas occupies 24 dm^3 at room conditions]

Apabila kuprum(II) karbonat dipanaskan, ia terurai menjadi kuprum(II) oksida dan gas karbon dioksida.

Jika 4.80 dm^3 gas karbon dioksida dihasilkan, apakah jisim kuprum(II) karbonat yang digunakan?

[Jisim atom relatif : C=12, O=16, Cu=64; 1 mol gas memenuhi 24 dm^3 gas pada keadaan bilik]

- A** 12.4 g
- B** 24.8 g
- C** 37.2 g
- D** 124.0 g
- 38** Atom W has 1 valence electron and 2 shells filled with electrons. Which of the following chemical equations represents a reaction between element W and water?
- Unsur W mempunyai 1 elektron valens dan 2 petala berisi elektron. Antara persamaan kimia berikut, yang manakah menunjukkan tindak balas antara unsur W dan air?*



- 39 Table 3 shows the proton number of J, K, L and M elements.
Jadual 3 menunjukkan nombor proton bagi unsur J, K, L dan M.

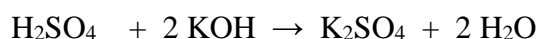
Element <i>Unsur</i>	Proton number <i>Nombor proton</i>
J	3
K	6
L	8
M	17

Table 3
Jadual 3

Which of the following pair of elements form a compound with high melting point?

Antara pasangan unsur berikut, yang manakah membentuk sebatian dengan takat lebur yang tinggi?

- A** J and M
J dan M
- B** K and L
K dan L
- C** K and M
K dan M
- D** J and K
J dan K
- 40 The following chemical equation represent the neutralization reaction between sulphuric acid and potassium hydroxide.
Persamaan kimia berikut menunjukkan tindak balas peneutralan di antara asid sulfurik dan kalium hidroksida.



20.0 cm³ of 2.0 mol dm⁻³ potassium hydroxide solution was titrated with 1.0 mol dm⁻³ sulphuric acid.

20.0 cm³ larutan kalium hidroksida 2.0 mol dm⁻³ telah dititratkan dengan asid sulfurik 1.0 mol dm⁻³.

What is the final burette reading if the initial reading is 3.00 cm³?

Apakah bacaan akhir buret jika bacaan awalnya adalah 3.00 cm³?

- A** 20.00 cm³
- B** 23.00 cm³
- C** 40.00 cm³
- D** 43.00 cm³

- 41 Diagram 11 shows the apparatus set-up to purify an impure silver plate. 4.0 g of impure silver plate dissolved while 3.8 g of silver deposited at the pure silver plate.

Rajah 11 menunjukkan susunan radas untuk menuliskan kepingan argentum tak tulen. 4.0 g kepingan argentum tak tulen melarut manakala 3.8 g argentum terendap pada kepingan argentum tulen.

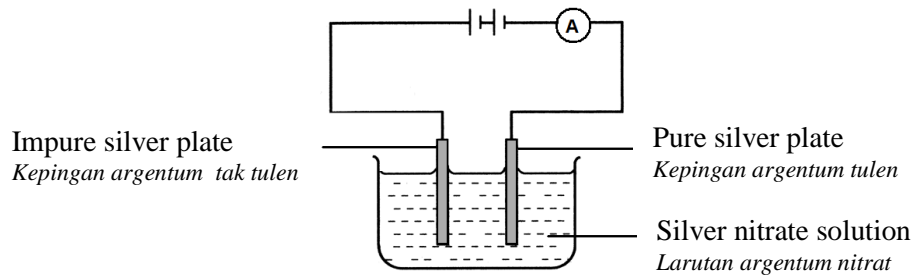


Diagram 11
Rajah 11

What is the percentage of purity of the impure silver plate?
Apakah peratus ketulenan bagi kepingan argentum tak tulen itu?

- A 5.0 %
B 5.3 %
C 51.3 %
D 95.0 %
- 42 Diagram 12 shows the apparatus set-up for dilution of sodium hydroxide solution.
Rajah 12 menunjukkan susunan radas bagi pencairan larutan natrium hidroksida.

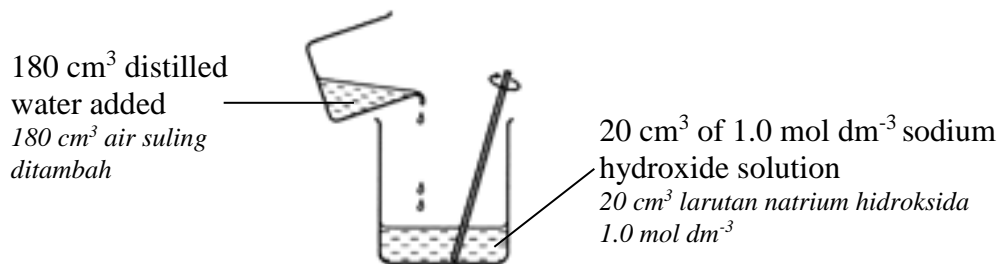


Diagram 12
Rajah 12

What is the new concentration of sodium hydroxide solution?
Apakah kepekatan larutan natrium hidroksida yang baru?

- A 0.02 mol dm^{-3}
B 0.10 mol dm^{-3}
C 0.11 mol dm^{-3}
D 0.90 mol dm^{-3}

- 43 Diagram 13 shows a chemical cell.
Rajah 13 menunjukkan satu sel kimia.

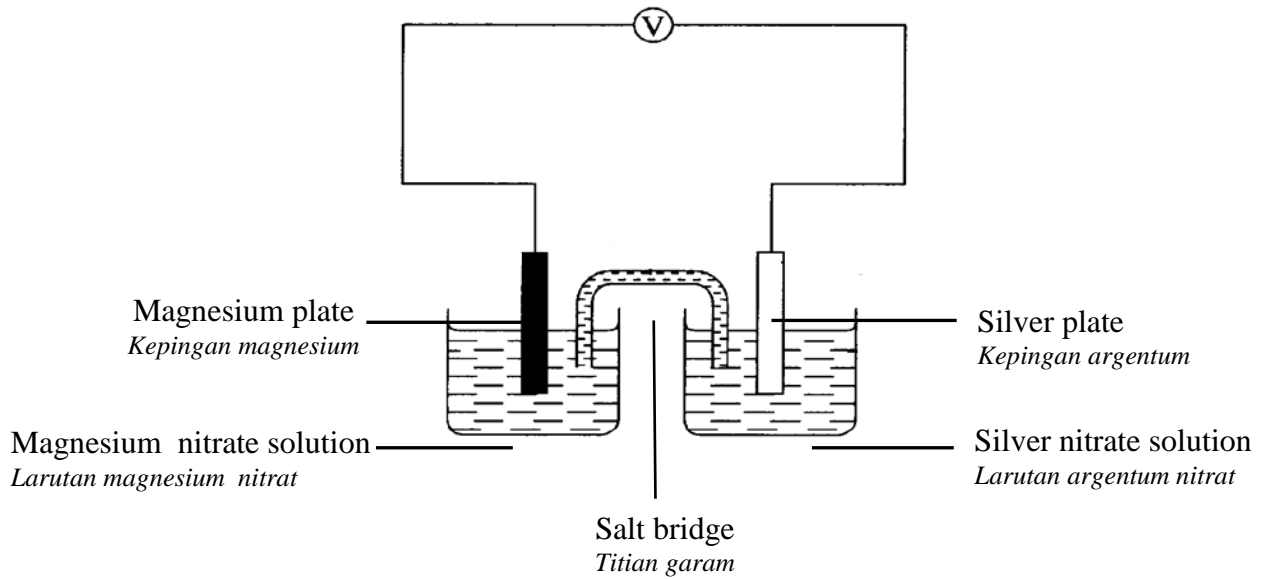


Diagram 13
Rajah 13

Which half equations represent the reaction at the negative and positive terminal?
Persamaan setengah yang manakah mewakili tindak balas di terminal negatif dan positif?

	Negative terminal <i>Terminal negatif</i>	Positive terminal <i>Terminal positif</i>
A	$\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$	$\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$
B	$\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$	$\text{Ag}^+ + \text{e}^- \rightarrow \text{Ag}$
C	$\text{Ag} \rightarrow \text{Ag}^+ + \text{e}^-$	$\text{Mg}^{2+} + 2\text{e}^- \rightarrow \text{Mg}$
D	$4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$	$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$

- 44 Diagram 14 shows the conversion of rubber Q to rubber R through Process P.
Rajah 14 menunjukkan penukaran getah Q kepada getah R melalui Proses P.

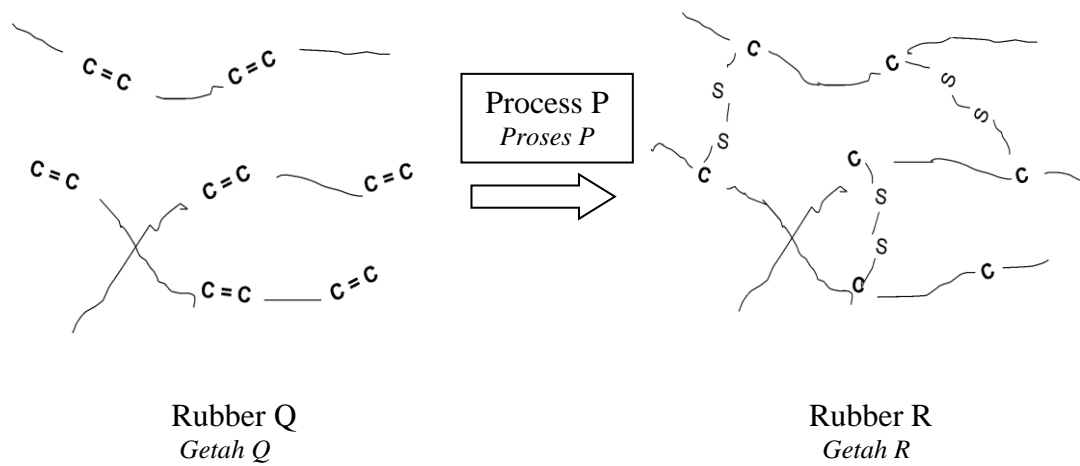


Diagram 14
Rajah 14

Which of the following explains the purpose of Process P?
Antara berikut, yang manakah menerangkan tujuan Proses P?

- A** To reduce the elasticity of rubber
Mengurangkan kekenyalan getah
- B** To increase the size of rubber molecules
Meningkatkan saiz molekul getah
- C** To decrease the melting point of rubber
Mengurangkan takat lebur getah
- D** To increase the oxidation of rubber
Meningkatkan pengoksidaan getah

- 45 Table 4 shows the result to identify the cation and anion for salt N solution.
Jadual 4 menunjukkan keputusan ujian untuk mengenalpasti kation dan anion bagi larutan garam N.

Reagents <i>Reagen</i>	Observation <i>Pemerhatian</i>
Add dilute sulphuric acid <i>Asid sulfurik cair ditambah</i>	White precipitate form <i>Mendakan putih terbentuk</i>
Add dilute nitric acid and add silver nitrate solution <i>Asid nitrik cair dan larutan argentum nitrat ditambah</i>	White precipitate form <i>Mendakan putih terbentuk</i>
Add a few drops of sodium hydroxide solution until excess <i>Larutan natrium hidroksida ditambah sedikit demi sedikit sehingga berlebihan.</i>	White precipitate forms and not dissolve in excess sodium hydroxide solution <i>Mendakan putih terbentuk dan tidak larut dalam larutan natrium hidroksida berlebihan</i>

Table 4
Jadual 4

Based on the results of the experiment, what is salt N?
Berdasarkan keputusan eksperimen, apakah garam N?

- A** Aluminium chloride
Aluminium klorida
- B** Magnesium sulphate
Magnesium sulfat
- C** Calcium chloride
Kalsium klorida
- D** Zinc sulphate
Zink sulfat

- 46 Diagram 15 shows curve I for the reaction between 20 cm^3 of 0.30 mol dm^{-3} hydrochloric acid with excess zinc.

Rajah 15 menunjukkan lengkung I bagi tindak balas diantara 20 cm^3 asid hidroklorik 0.30 mol dm^{-3} dengan zink berlebihan.

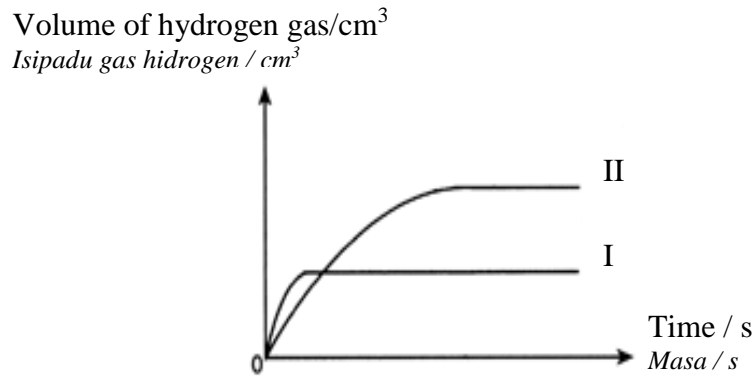


Diagram 15
Rajah 15

If the experiment is repeated, which solution will produce curve II?
Jika eksperimen diulangi, larutan yang manakah akan menghasilkan lengkung II?

- A 20 cm^3 of 0.50 mol dm^{-3} hydrochloric acid
 20 cm^3 asid hidroklorik 0.50 mol dm^{-3}
- B 40 cm^3 of 0.15 mol dm^{-3} hydrochloric acid
 40 cm^3 asid hidroklorik 0.15 mol dm^{-3}
- C 60 cm^3 of 0.20 mol dm^{-3} hydrochloric acid
 60 cm^3 asid hidroklorik 0.20 mol dm^{-3}
- D 80 cm^3 of 0.40 mol dm^{-3} hydrochloric acid
 80 cm^3 asid hidroklorik 0.40 mol dm^{-3}

- 47 Table 5 shows the observation when different mixtures of metals and metal oxides are heated strongly.

Jadual 5 menunjukkan pemerhatian apabila campuran logam dan oksida logam yang berbeza dipanaskan dengan kuat.

Mixture <i>Campuran</i>	Observation <i>Pemerhatian</i>
Metal P and metal Z oxide <i>Logam P dan oksida logam Z</i>	Glowing <i>Berbara</i>
Metal Q and metal R oxide <i>Logam Q dan oksida logam R</i>	No change <i>Tiada perubahan</i>
Metal Q and metal T oxide <i>Logam Q dan oksida logam T</i>	Glowing <i>Berbara</i>
Metal R and metal Z oxide <i>Logam R dan oksida logam Z</i>	No change <i>Tiada perubahan</i>

Table 5
Rajah 5

Which of the following arrangement represents the reactivity of metal with oxygen in descending order?

Antara susunan berikut, yang manakah mewakili kereaktifan logam terhadap oksigen dalam susunan menurun?

- A** Z, R, Q, T, P
- B** P, Z, Q, T, R
- C** T, Q, R, Z, P
- D** P, Z, R, Q, T

- 48 Diagram 16 shows the structural formula of two compounds.
Rajah 16 menunjukkan formula struktur bagi dua sebatian.

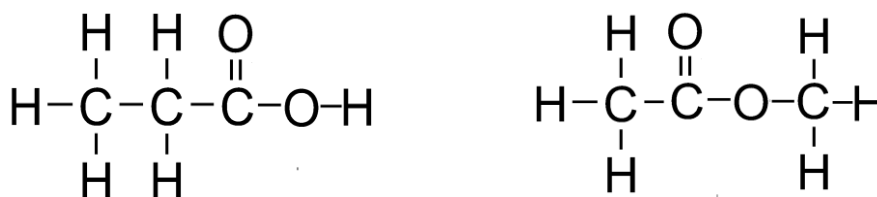


Diagram 16
Rajah 16

What are the similarities and differences between these compounds?
Apakah persamaan dan perbezaan antara kedua-dua sebatian?

	Similarities <i>Persamaan</i>	Differences <i>Perbezaan</i>
A	Molecular formula <i>Formula molekul</i>	Chemical properties <i>Sifat-sifat kimia</i>
B	Functional group <i>Kumpulan berfungsi</i>	Physical properties <i>Sifat-sifat fizikal</i>
C	Isomers <i>Isomer</i>	Molecular formula <i>Formula molekul</i>
D	General formula <i>Formula am</i>	Relative molecular masses <i>Jisim molekul relatif</i>

- 49 Table 6 shows two experiments between different halogens and potassium bromide solution. The mixture is then added with 1,1,1-trichloroethane.

Jadual 6 menunjukkan dua eksperimen antara halogen berlainan dengan larutan kalium bromida. Campuran itu kemudiannya ditambah dengan 1,1,1-trikloroetana.

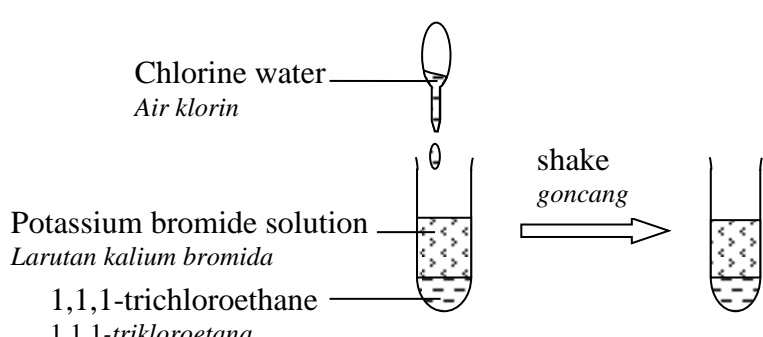
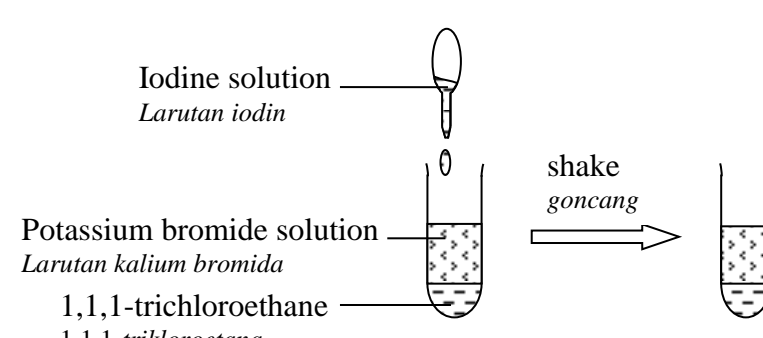
<p>Experiment I <i>Eksperimen I</i></p>	 <p>Chlorine water <i>Air klorin</i></p> <p>Potassium bromide solution <i>Larutan kalium bromida</i></p> <p>1,1,1-trichloroethane <i>1,1,1-trikloroetana</i></p> <p>shake <i>goncang</i></p>
<p>Experiment II <i>Eksperimen II</i></p>	 <p>Iodine solution <i>Larutan iodin</i></p> <p>Potassium bromide solution <i>Larutan kalium bromida</i></p> <p>1,1,1-trichloroethane <i>1,1,1-trikloroetana</i></p> <p>shake <i>goncang</i></p>

Table 6
Jadual 6

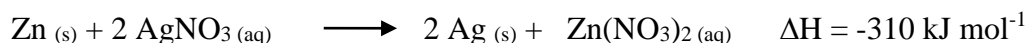
Which of the following are the correct observation for the 1,1,1-trichloroethane layer in both experiments?

Antara berikut, yang manakah pemerhatian yang betul bagi lapisan 1,1,1-trikloroetana dalam kedua-dua eksperimen?

	Experiment I <i>Eksperimen I</i>	Experiment II <i>Eksperimen II</i>
A	Colourless layer <i>Lapisan tidak berwarna</i>	Brown layer <i>Lapisan perang</i>
B	Purple layer <i>Lapisan ungu</i>	Brown layer <i>Lapisan perang</i>
C	Colourless layer <i>Lapisan tidak berwarna</i>	Purple layer <i>Lapisan ungu</i>
D	Brown layer <i>Lapisan perang</i>	Purple layer <i>Lapisan ungu</i>

- 50** The reaction between zinc and silver nitrate solution is represented by the following equation:

Tindak balas antara zink dengan argentum nitrat diwakili dengan persamaan berikut :



Which of the statements is true concerning the above reaction?

Antara pernyataan berikut, yang manakah benar mengenai tindak balas di atas?

- I The zinc metal is oxidised
Logam zink di oksidakan
 - II Oxidation number of silver decreases from +1 to 0
Nombor pengoksidaan argentum berkurang dari +1 kepada 0
 - III The temperature of the mixture decreases during reaction.
Suhu campuran menurun semasa tindak balas
 - IV When 2.0 mol of silver is displaced, 620 kJ of heat is released.
Bila 2.0 mol argentum disesarkan, 620 kJ haba dibebaskan
- A** I and III
I dan III
 - B** II and IV
II dan IV
 - C** I, II and III
I, II dan III
 - D** I, II and IV
I, II dan IV

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **50** questions.
Kertas soalan ini mengandungi 50 soalan.
2. Answer **all** questions.
Jawab semua soalan.
3. Answer each question by blackening the correct space on the answer sheet.
Jawab setiap soalan dengan menghitamkan ruangan yang betul pada kertas jawapan.
4. Blacken only **one** space for each question.
Hitamkan satu ruangan sahaja pada setiap soalan.
5. If you wish to change your answer, erase the blackened mark that you have made. Then blacken the new answer.
Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.
6. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
7. You may use a scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.