

SULIT

CONFIDENTIAL

4541/1

Chemistry

Paper 1

Ogos

2019

1 1/4 hour



**SIJIL PENDIDIKAN
MAKTAB RENDAH SAINS MARA
2019**

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 advised to read INFORMATION FOR CANDIDATES on page 28
Calon dikehendaki membaca MAKLUMAT UNTUK PELAJAR di halaman 28*

Kertas peperiksaan ini mengandungi 28 halaman bercetak.

- 1 Which pair is correctly matched?
 Antara pasangan berikut, manakah padanan yang betul?

	Substance <i>Bahan</i>	Type of particle <i>Jenis zarah</i>
A	Methanol <i>Metanol</i>	Atom <i>Atom</i>
B	Copper(II) sulphate <i>Kuprum(II) sulfat</i>	Molecule <i>Molekul</i>
C	Carbon monoxide <i>Karbon monoksida</i>	Ion <i>Ion</i>
D	Ammonia <i>Ammonia</i>	Molecule <i>Molekul</i>

- 2 Diagram 1 shows patient undergoing Gamma Knife therapy. The gamma radiation used to destroy cancer cells is generated by an isotope.
 Rajah 1 menunjukkan terapi Gamma Knife. Sinar gamma yang digunakan untuk membunuh sel kanser dihasilkan oleh suatu isotop.

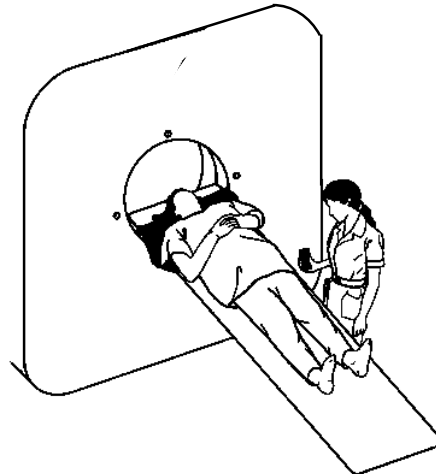


Diagram 1
 Rajah 1

What is the name of the isotope?
 Apakah nama isotop tersebut?

- A Iodine-131
Iodin-131
- B Cobalt-60
Kobalt-60
- C Sodium-24
Natrium-24
- D Carbon-12
Karbon-12

3

Potassium dichromate(VI) is commonly used as an oxidizing agent for laboratory experiment.

Kalium dikromat(VI) biasanya digunakan sebagai agen pengoksidaan untuk eksperimen di makmal.

What is the chemical formula for potassium dichromate(VI)?

Apakah formula kimia bagi kalium dikromat(VI)?

- A K_2CrO_2
- B K_2CrO_4
- C $K_2Cr_2O_4$
- D $K_2Cr_2O_7$

4

The following statements refer to the contributions of a scientist in the development of the Periodic Table of Elements.

Pernyataan berikut merujuk kepada penemuan saintis dalam perkembangan Jadual Berkala Unsur.

- Studied the X-ray spectrum of elements.
Mengkaji spektrum sinar-X unsur-unsur.
- Arranged the elements in the Periodic Table of Elements based on the increasing order of proton number.
Menyusun unsur-unsur dalam Jadual Berkala Unsur mengikut pertambahan nombor proton.

Who was the scientist?

Siapakah saintis tersebut?

- A Lothar Meyer
- B John Newlands
- C Henry J.G. Moseley
- D Dmitri Mendeleev

[Lihat halaman sebelah

- 5 Diagram 2 shows a compound.
Rajah 2 menunjukkan suatu sebatian.

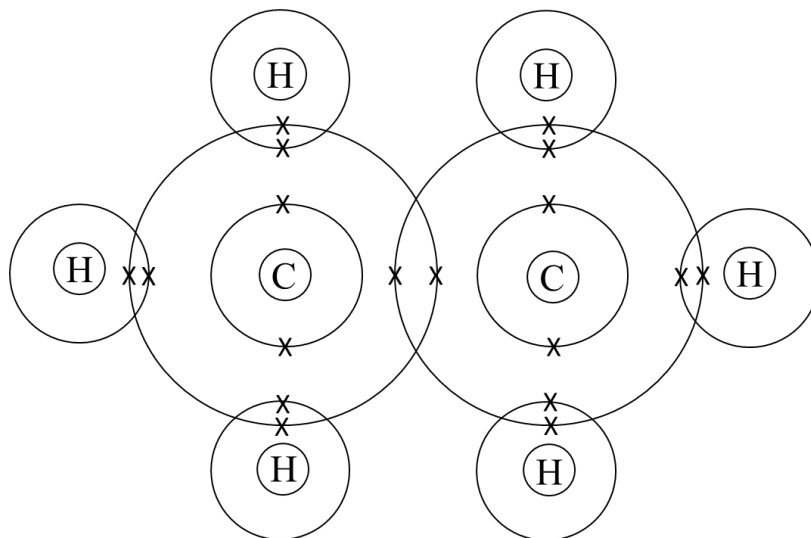


Diagram 2
Rajah 2

How many pairs of electrons are shared by the atoms in this compound?
Berapakah pasangan elektron yang dikongsi oleh atom-atom dalam sebatian ini?

- A 6
B 7
C 12
D 14
- 6 Which of the following solvents can dissolve potassium oxide?
Antara pelarut-pelarut berikut, yang manakah boleh melarutkan kalium oksida?
- A Ether
Eter
- B Propanone
Propanon
- C Water
Air
- D Benzene
Benzena

- 7 Which of the following is an electrolyte?
Antara berikut, yang manakah merupakan elektrolit?
- A Dilute nitric acid
Asid nitrik cair
 - B Sucrose solution
Larutan sukrosa
 - C Molten acetamide
Leburan asetamida
 - D Molten copper
Leburan kuprum
- 8 Which of the following substances is a monoprotic acid?
Antara bahan-bahan berikut, yang manakah merupakan asid monoprotik?
- A Propanoic acid, C_2H_5COOH
Asid propanoik, C_2H_5COOH
 - B Phosphoric acid, H_3PO_4
Asid fosforik, H_3PO_4
 - C Sulphuric acid, H_2SO_4
Asid sulfurik, H_2SO_4
 - D Carbonic acid, H_2CO_3
Asid karbonik, H_2CO_3
- 9 Which of the following is an insoluble salt?
Antara berikut, yang manakah garam tak terlarutkan?
- A Silver nitrate
Argentum nitrat
 - B Ammonium chloride
Ammonium klorida
 - C Calcium sulphate
Kalsium sulfat
 - D Potassium carbonate
Kalium karbonat

- 10 Which of the following solution will form white precipitate which is insoluble in excess sodium hydroxide solution?

Antara larutan berikut, manakah akan membentuk mendakan putih yang tidak larut dalam larutan natrium hidroksida yang berlebihan?

- A Lead(II) nitrate
Plumbum(II) nitrat
- B Magnesium chloride
Magnesium klorida
- C Aluminium nitrate
Aluminium nitrat
- D Zinc sulphate
Zink sulfat

- 11 Diagram 3 shows one of the stages in the production of sulphuric acid using the Contact Process.

Rajah 3 menunjukkan salah satu peringkat dalam pembuatan asid sulfurik menggunakan Proses Sentuh.

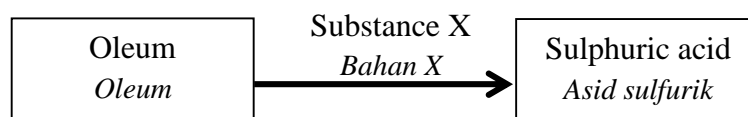


Diagram 3
Rajah 3

What is substance X?

Apakah bahan X?

- A Sulphur
Sulfur
 - B Water
Air
 - C Oxygen
Oksigen
 - D Sulphur dioxide
Sulfur dioksida
- 12 Which of the following is a slow reaction?
- Yang manakah merupakan tindak balas perlahan?*
- A Striking a match
Goresan mancis
 - B Burning of petrol
Pembakaran petrol
 - C Fireworks display
Pertunjukan bunga api
 - D Raising of bread dough
Pengembangan doh roti

- 13 Which substance is an inorganic compound?
Bahan yang manakah merupakan sebatian tak organik?

- A Polystyrene
Polisterina
- B Carbon dioxide
Karbon dioksida
- C Tetrachloromethane
Tetraklorometana
- D Formic acid
Asid formik

- 14 Diagram 4 shows a structural formula of a compound that is used as an artificial banana flavouring.
Rajah 4 menunjukkan formula struktur bagi suatu sebatian yang digunakan sebagai perisa pisang tiruan.

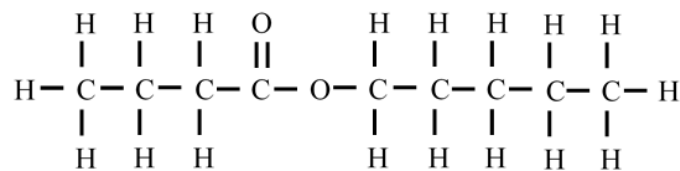


Diagram 4
Rajah 4

What is the name of the compound?
Apakah nama bagi sebatian tersebut?

- A Propyl butanoate
Propil butanoat
- B Butyl pentanoate
Butil pentanoat
- C Butyl propanoate
Butil propanoat
- D Pentyl butanoate
Pentil butanoat
- 15 Which of the following substances can change the colourless potassium bromide solution to brown?
Antara bahan-bahan berikut, yang manakah boleh menukarkan larutan tanpa warna kalium bromida ke perang?
- A Sodium sulphite solution
Larutan natrium sulfit
- B Chlorine water
Air klorin
- C Hydrogen sulphide
Hidrogen sulfida
- D Magnesium
Magnesium

[Lihat halaman sebelah
SULIT

- 16 Which of the following metals can reduced carbon dioxide gas when heated?
Antara logam-logam berikut, yang manakah boleh menurunkan gas karbon dioksida apabila dipanaskan?
- A Zinc
Zink
 - B Iron
Ferum
 - C Tin
Stanium
 - D Magnesium
Magnesium
- 17 Which of the following chemical substances can be used in a cold pack?
Antara bahan-bahan kimia berikut, yang manakah boleh digunakan di dalam pek sejuk?
- A Magnesium sulphate
Magnesium sulfat
 - B Calcium chloride
Kalsium klorida
 - C Ammonium nitrate
Ammonium nitrat
 - D Sodium acetate
Natrium asetat
- 18 Which of the following are used to make detergents?
Antara berikut, yang manakah digunakan dalam pembuatan detergen?
- I Petroleum
Petroleum
 - II Fats or oils
Lemak atau minyak
 - III Potassium hydroxide
Kalium hidroksida
 - IV Glycerol
Gliserol
- A I and II
I dan II
 - B II and III
II dan III
 - C III and IV
III dan IV
 - D I and III
I dan III

- 19 Which of the following drugs is used to reduce fatigue and elevate mood?
Antara ubat-ubat berikut, yang manakah digunakan untuk mengurangkan kepenatan dan meningkatkan mood?
- A Paracetamol
Parasetamol
 - B Penicillin
Penisilin
 - C Amphetamine
Amfetamin
 - D Barbiturates
Barbiturat
- 20 Which of the following substances is used as food preservatives?
Antara bahan-bahan berikut, yang manakah digunakan sebagai pengawet makanan?
- A Sodium nitrite
Natrium nitrit
 - B Tartrazine
Tartrazina
 - C Ascorbic acid
Asid askorbik
 - D Monosodium glutamate
Mononatrium glutamat
- 21 The formula of the nitrate salt of M is MNO_3 .
What is the formula of the phosphate salt of M?
*Formula bagi garam nitrat M ialah MNO_3 .
Apakah formula bagi garam fosfat M?*
- A M_3PO_4
 - B M_2PO_4
 - C MPO_4
 - D $M_2(PO_4)_3$

- 22 Diagram 5 shows a graph of temperature against time for the heating of solid Q.
Rajah 5 menunjukkan graf suhu melawan masa bagi pemanasan pepejal Q.

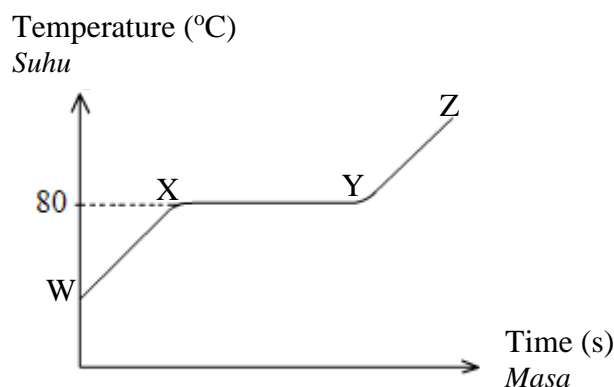


Diagram 5
Rajah 5

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

- A Solid Q starts to melt at X
Pepejal Q mula melebur pada X
- B Heat is released at WX
Haba dibebaskan pada WX
- C Kinetic energy is low at Y
Tenaga kinetik adalah rendah pada Y
- D The particles are very far apart from each other at Z
Zarah-zarah adalah sangat berjauhan antara satu sama lain pada Z
- 23 Which of the following pairs of chemical substances will produce effervescence when react?
Antara pasangan bahan-bahan berikut, yang manakah akan menghasilkan pembuakan apabila bertindak balas?
- A Copper and sulphuric acid
Kuprum dan asid sulfurik
- B Lithium and water
Litium dan air
- C Silver nitrate and lead
Argentum nitrat dan plumbum
- D Chlorine and potassium hydroxide
Klorin dan kalium hidroksida

- 24 Elements P and Q have proton numbers of 11 and 19. Which statements is correct?

*Unsur P dan Q mempunyai nombor proton 11 dan 19.
Pernyataan manakah yang betul?*

- A The melting point of P is higher than Q
Takat lebur P lebih tinggi berbanding Q
- B Atomic size of P is bigger than Q
Saiz atom P lebih besar berbanding Q
- C The density of P is higher than Q
Ketumpatan P lebih tinggi berbanding Q
- D The electropositivity of P is higher than Q
Keelektropositifan P lebih tinggi berbanding Q

- 25 Diagram 6 shows a simple chemical cell. Two different metals are used as electrodes.
Rajah 6 menunjukkan satu sel kimia ringkas. Dua logam yang berlainan digunakan sebagai elektrod.

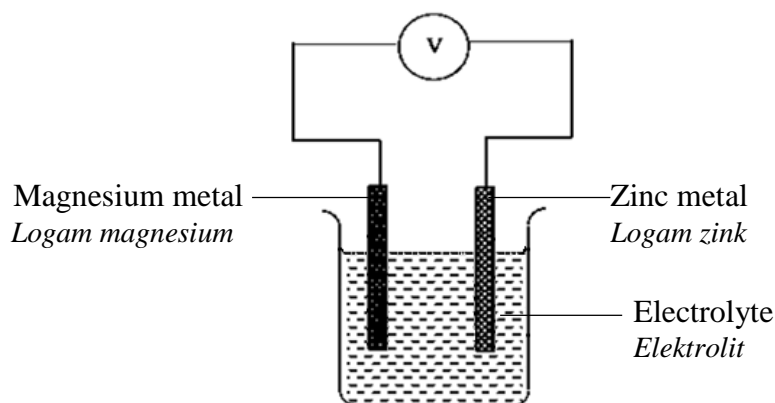


Diagram 6
Rajah 6

Which metal can be used to replace zinc metal to obtain the highest voltage reading?
Logam yang manakah boleh menggantikan logam zink untuk mendapatkan bacaan voltan yang paling tinggi?

- A Tin
Stanium
- B Silver
Argentum
- C Iron
Ferum
- D Lead
Plumbum

[*Lihat halaman sebelah*
SULIT

- 26 Diagram 7 shows the electron arrangement in compound JL.
Rajah 7 menunjukkan susunan elektron dalam sebatian JL.

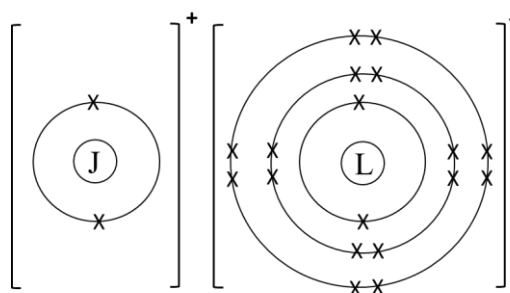
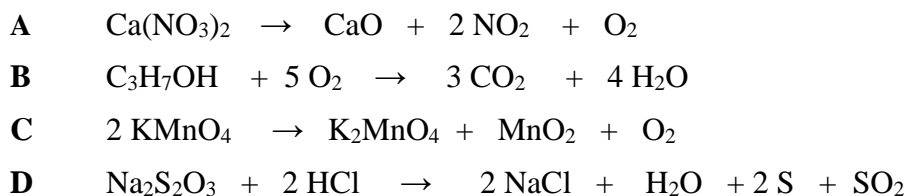


Diagram 7
Rajah 7

Which elements is represented by J and L?
Unsur-unsur manakah yang diwakili oleh J dan L?

	J	L
A	Beryllium <i>Berilium</i>	Fluorine <i>Florin</i>
B	Lithium <i>Litium</i>	Chlorine <i>Klorin</i>
C	Beryllium <i>Berilium</i>	Oxygen <i>Oksigen</i>
D	Lithium <i>Litium</i>	Sulphur <i>Sulfur</i>

- 27 Which chemical equation is correctly balanced?
Persamaan kimia manakah yang diseimbangkan dengan betul?



- 28 Table 1 shows the proton number of four elements in the Periodic Table of Elements.
Jadual 1 menunjukkan nombor proton bagi empat unsur dalam Jadual Berkala Unsur.

Element <i>Unsur</i>	Proton number <i>Nombor proton</i>
W	3
X	13
Y	6
Z	17

Table 1
Jadual 1

Which of the following pair of elements forms a compound that is not soluble in water?
Antara pasangan unsur-unsur berikut, manakah yang membentuk suatu sebatian yang tak larut dalam air?

- A W and Z
W dan Z
- B X and Z
X dan Z
- C W and Y
W dan Y
- D Y and Z
Y dan Z
- 29 The following chemical equation represents the reaction between calcium carbonate and nitric acid.
Persamaan kimia berikut menunjukkan tindak balas antara kalsium karbonat dan asid nitrik.



Which of the following factors increases the rate of reaction?
Antara faktor-faktor berikut, yang manakah meningkatkan kadar tindak balas tersebut?

- A Use copper(II) sulphate solution as a catalyst
Menggunakan larutan kuprum(II) sulfat sebagai mangkin
- B Increase the volume of nitric acid
Meningkatkan isipadu asid nitrik
- C Add water into the nitric acid
Menambahkan air kepada asid nitrik
- D Use calcium carbonate powder
Menggunakan serbuk kalsium karbonat

[Lihat halaman sebelah
SULIT

- 30 When a white metal carbonate, XCO_3 is heated strongly, the residue is brown when hot and turns yellow when cold.

Which of the following metals could be X?

Apabila logam karbonat, XCO_3 yang berwarna putih dipanaskan dengan kuat, baki yang terhasil berwarna perang semasa panas dan bertukar kuning apabila sejuk. Antara berikut, yang manakah logam X?

- A Zinc
Zink
- B Copper
Kuprum
- C Lead
Plumbum
- D Aluminium
Aluminium
- 31 Diagram 8 shows structural formulae of compounds T and U.
Rajah 8 menunjukkan formula struktur bagi sebatian T dan sebatian U.

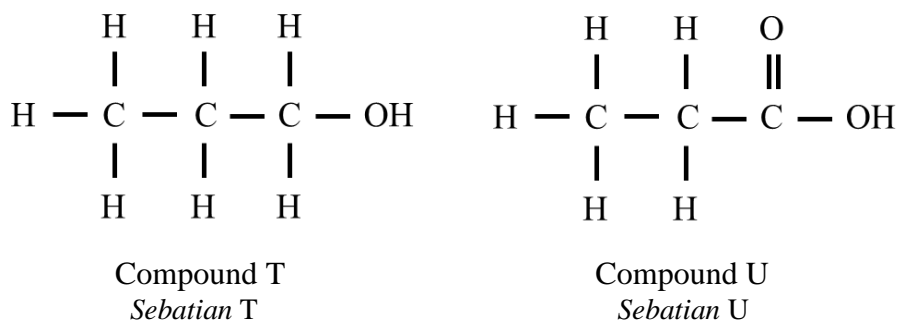


Diagram 8
Rajah 8

Which reagent can be used to differentiate compound T and U?
Reagen manakah yang boleh digunakan untuk membezakan sebatian T dan U?

- A Sodium hydroxide solution
Larutan natrium hidroksida
- B Bromine water
Air bromin
- C Magnesium
Magnesium
- D Potassium manganate(VII) solution
Larutan kalium manganat(VII)

- 32 Diagram 9 shows a graph of volume of carbon dioxide gas released against time when marble chips is reacted with hydrochloric acid.

Rajah 9 menunjukkan graf isipadu gas karbon dioksida yang terbebas melawan masa apabila ketulan marmar ditindakbalaskan dengan asid hidroklorik.

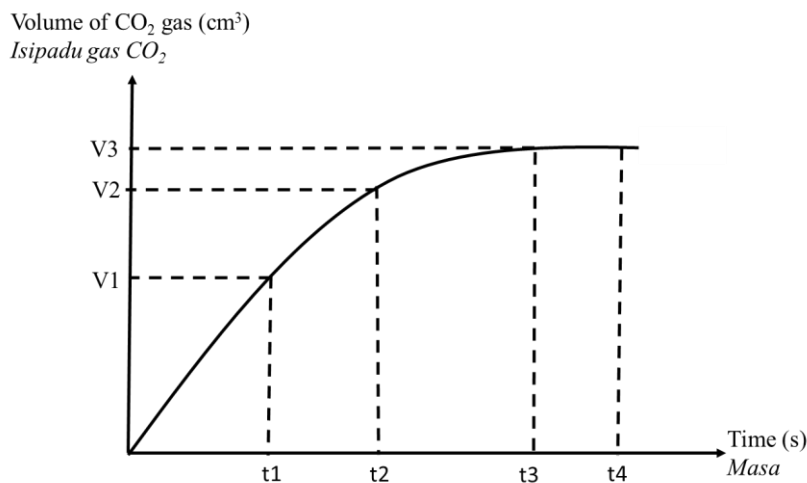


Diagram 9
Rajah 9

Which of the following statements is correct about the graph?

Antara berikut, pernyataan manakah yang betul tentang graf?

- A The overall average rate of reaction is $\frac{V3}{t3} \text{ cm}^3 \text{ s}^{-1}$
Kadar tindak balas purata keseluruhan ialah $\frac{V3}{t3} \text{ cm}^3 \text{ s}^{-1}$
- B The reaction is completed at t4 second
Tindak balas lengkap pada t4 saat
- C The rate of reaction at t2 second is higher than t1 second
Kadar tindak balas pada t2 saat lebih tinggi dari t1 saat
- D The rate of reaction at t1 second is $\frac{V1}{t1} \text{ cm}^3 \text{ s}^{-1}$
Kadar tindak balas pada t1 saat ialah $\frac{V1}{t1} \text{ cm}^3 \text{ s}^{-1}$

[Lihat halaman sebelah
SULIT

- 33 Diagram 10 shows the apparatus set-up for reaction between zinc and copper(II) sulphate solution.

Rajah 10 menunjukkan susunan radas bagi tindak balas antara zink dan larutan kuprum(II) sulfat.

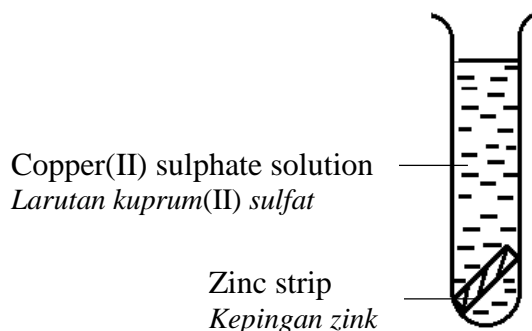
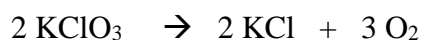


Diagram 10
Rajah 10

Which of the following statements is correct?

Antara pernyataan berikut, yang manakah adalah betul?

- A** Zinc acts as an oxidising agent
Zink bertindak sebagai agen pengoksidaan
- B** Copper(II) ion is reduced
Ion kuprum(II) diturunkan
- C** Oxidation number of copper(II) ion decreases from +2 to 0
Nombor pengoksidaan bagi ion kuprum(II) berkurang daripada +2 ke 0
- D** A grey solid is deposited on zinc strip
Pepejal kelabu terenal pada kepingan zink
- 34 The chemical equation for the reaction to produce oxygen is as follows:
Persamaan kimia bagi tindak balas penghasilan gas oksigen adalah seperti berikut:



What is the change in oxidation number of chlorine?

Apakah perubahan nombor pengoksidaan bagi klorin ?

- A** -2 to -1
-2 kepada -1
- B** +4 to -2
+4 kepada -2
- C** +5 to -1
+5 kepada -1
- D** +1 to -2
+1 kepada -2

- 35 Element R which can be produced through electrolysis is commonly used as an antiseptic in swimming pool and drinking water.
Element S is located in the same group as element R in the Periodic Table of Elements.

Unsur R yang dihasilkan melalui elektrolisis digunakan secara meluas sebagai antiseptik dalam kolam renang dan air minuman.

Unsur S terletak dalam kumpulan yang sama dengan unsur R dalam Jadual Berkala Unsur.

Which of the following statements are chemical properties of element S?

Antara pernyataan-pernyataan berikut, yang manakah sifat kimia bagi unsur S?

- I Reacts with water to produce acidic solution
Bertindak balas dengan air menghasilkan larutan berasid
- II Reacts with iron wool to produce brown solid
Bertindak balas dengan wul besi menghasilkan pepejal perang
- III Reacts with sodium hydroxide solution to produce alkaline solution
Bertindak balas dengan larutan natrium hidroksida menghasilkan larutan beralkali
- IV Reacts with oxygen to produce black solid
Bertindak balas dengan oksigen menghasilkan pepejal hitam
- A I and II
I dan II
- B I and III
I dan III
- C II and III
II dan III
- D II and IV
II dan IV

[Lihat halaman sebelah

- 38** Given that heat of combustion of butane is $-2878 \text{ kJ mol}^{-1}$.
What is the fuel value of butane?
[Relative atomic mass: H = 1, C = 12]
*Diberi haba pembakaran butana ialah $-2878 \text{ kJ mol}^{-1}$.
Berapakah nilai bahan api bagi butana?
[Jisim atom relatif: H = 1, C = 12]*
- A 39.97 kJ g^{-1}
B 49.62 kJ g^{-1}
C 51.39 kJ g^{-1}
D 65.41 kJ g^{-1}
- 39** 19.2 g of element M reacts with 21.0 g of Y to form a compound with the formula MY_2 .
What is the relative atomic mass of element M?
[Relative atomic mass of Y = 35]
*19.2 g unsur M bertindak balas dengan 21.0 g Y membentuk suatu sebatian dengan formula MY_2 .
Apakah jisim atom relatif bagi unsur M?
[Jisim atom relatif bagi Y = 35]*
- A 16
B 32
C 64
D 128
- 40** 0.20 mol of zinc powder react with excess dilute nitric acid.
After 5 minutes, 0.05 mol of zinc remains as residue.
What is the average rate of the reaction?
[Relative atomic mass of Zn = 65]
*0.20 mol serbuk zink bertindak balas dengan asid nitrik cair.
Selepas 5 minit, 0.05 mol zink tertinggal sebagai baki.
Apakah kadar tindak balas purata bagi tindak balas ini?
[Jisim atom relatif bagi Zn = 65]*
- A 0.65 g min^{-1}
B 1.95 g min^{-1}
C 2.60 g min^{-1}
D 3.25 g min^{-1}

- 41 Diagram 12 shows a list of chemicals found in a sample of water from one of the river in Malaysia due to pollution by a factory.

Rajah 12 menunjukkan senarai bahan kimia dalam suatu sampel air dari sebatang sungai di Malaysia yang dicemari oleh sebuah kilang.

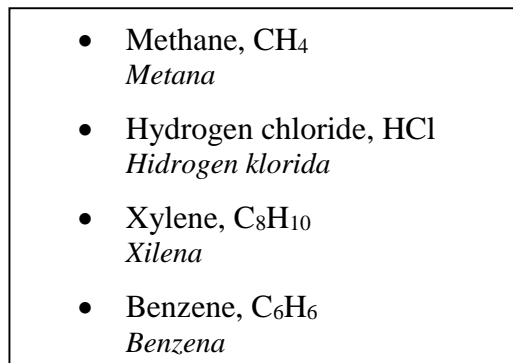


Diagram 12
Diagram 12

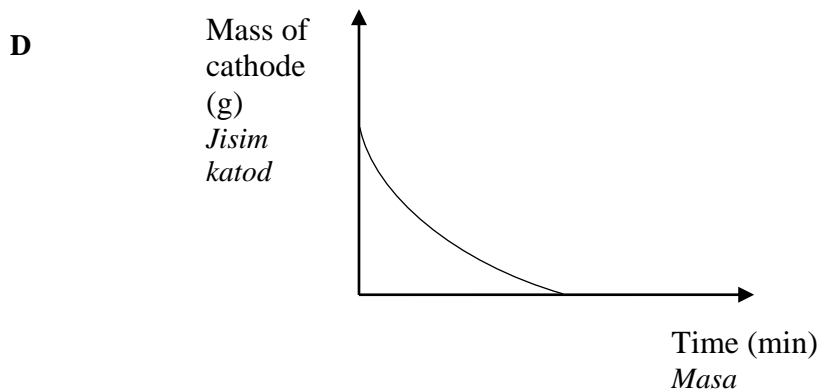
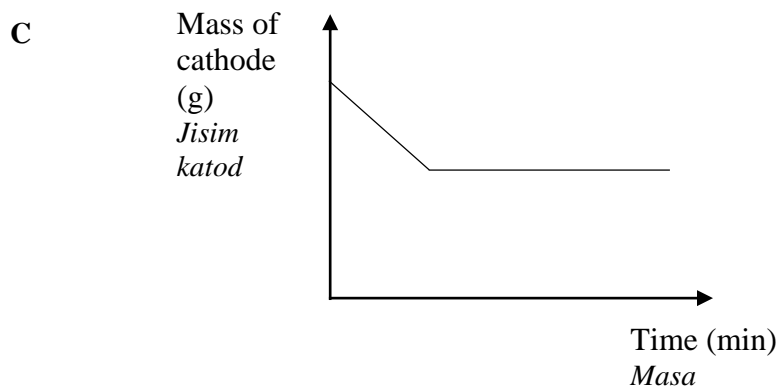
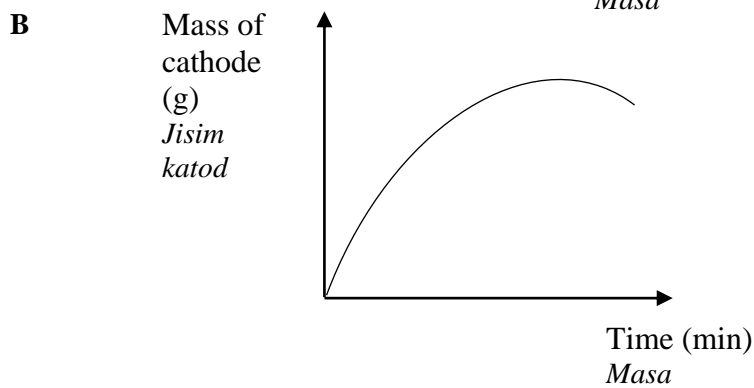
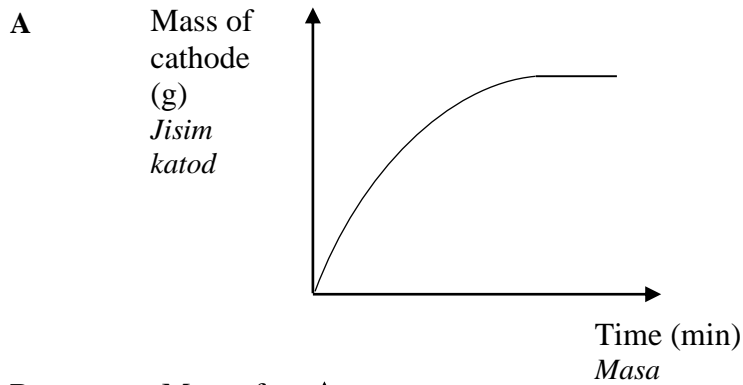
As the chemist of the factory, you are responsible to treat the effluent before disposal. Which of the following actions should be taken?

Sebagai ahli kimia di sebuah kilang, anda bertanggungjawab merawat bahan sisa sebelum dilupuskan.

Antara berikut, yang manakah tindakan-tindakan yang wajar dilakukan?

- I Burning methane in open air to produce carbon dioxide gas
Pembakaran metana secara terbuka bagi menghasilkan gas karbon dioksida
- II Dissolving xylene in water
Melarutkan xilena ke dalam air
- III Passing hydrogen chloride through calcium carbonate
Mengalirkan hidrogen klorida melalui kalsium karbonat
- IV Flowing the effluent into bromine water
Alirkan bahan sisa ke dalam air bromin
- A I and II
I dan II
- B I and III
I dan III
- C I and IV
I dan IV
- D II and IV
II dan IV

- 42 An aqueous solution of copper(II) sulphate was electrolysed using copper electrodes. Which of the following graphs represents the mass of cathode against time?
Larutan akueus kuprum(II) sulfat telah dielektrolisiskan menggunakan elektrod kuprum.
Antara graf-graf berikut, yang manakah menunjukkan perubahan jisim katod melawan masa?



[Lihat halaman sebelah
SULIT

- 43 Table 2 shows the information of three voltaic cells.
Jadual 2 menunjukkan maklumat bagi tiga sel volta.

Voltaic cell <i>Sel volta</i>	Electrodes <i>Elektrod</i>	Potential difference (V) <i>Beza keupayaan</i>	Positive terminal <i>Terminal positif</i>
I	X and W <i>X dan W</i>	1.6	X
II	Y and X <i>Y dan X</i>	0.2	Y
III	Z and W <i>Z dan W</i>	2.6	Z

Table 2
Jadual 2

What is the potential difference of the voltaic cell consisting of Z and Y electrodes?
Berapakah beza keupayaan sel volta yang terdiri daripada elektrod Z dan Y?

- A 2.4 V
- B 1.8 V
- C 1.0 V
- D 0.8 V

- 44 Diagram 13 shows an extreme sport bicycle and a list of a few choices of substance that can be used to increase the quality of the bicycle.

Rajah 13 menunjukkan sebuah basikal sukan ekstrem dan senarai beberapa pilihan bahan yang boleh digunakan bagi meningkatkan kualiti ciri basikal tersebut.

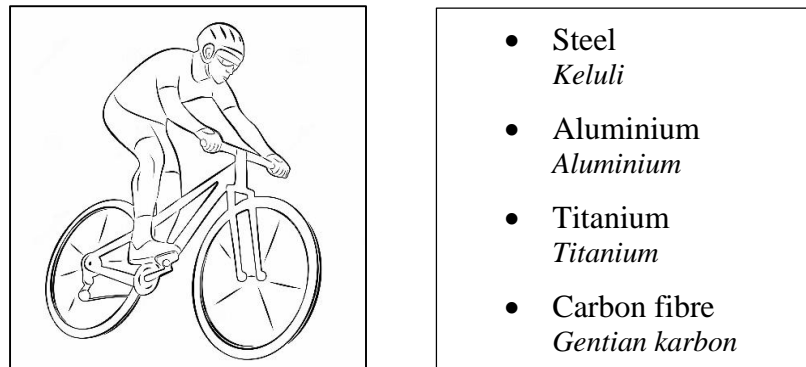


Diagram 13
Rajah 13

Which of the following shows the exact characteristics for each substance to build an extreme bicycle?

Antara berikut, manakah menunjukkan ciri-ciri yang tepat bagi setiap bahan untuk membina sebuah basikal ekstrem?

	Steel <i>Keluli</i>	Aluminium <i>Aluminium</i>	Titanium <i>Titanium</i>	Carbon fibre <i>Gentian karbon</i>
A	Very high tensile <i>Sangat tahan regangan</i>	Very light <i>Sangat ringan</i>	Not easily corrode <i>Tidak mudah terkakis</i>	Great formability and durability <i>Kebolehtempaan dan kemampunan yang baik</i>
B	Not easily corrode <i>Tidak mudah terkakis</i>	Very high tensile <i>Sangat tahan regangan</i>	Great formability and durability <i>Kebolehtempaan dan kemampunan yang baik</i>	Very light <i>Sangat ringan</i>
C	Great formability and durability <i>Kebolehtempaan dan kemampunan yang baik</i>	Not easily corrode <i>Tidak mudah terkakis</i>	Very high tensile <i>Sangat tahan regangan</i>	Very light <i>Sangat ringan</i>
D	Very light <i>Sangat ringan</i>	Great formability and durability <i>Kebolehtempaan dan kemampunan yang baik</i>	Very high tensile <i>Sangat tahan regangan</i>	Not easily corrode <i>Tidak mudah terkakis</i>

[Lihat halaman sebelah
SULIT

- 45 Table 3 shows the number of electrons and neutrons for X^{2+} and Y^- ion. The letters used are not the actual symbol of the elements.

Jadual 3 menunjukkan bilangan elektron dan neutron bagi ion X^{2+} dan Y^- . Huruf yang digunakan bukan simbol sebenar unsur tersebut.

Ion <i>Ion</i>	Number of electron <i>Bilangan elektron</i>	Number of neutron <i>Bilangan neutron</i>
X^{2+}	10	12
Y^-	18	18

Table 3
Jadual 3

Which of the following shows the correct nucleon number and proton number of atom X or Y?

Antara yang berikut, yang manakah menunjukkan nombor nukleon dan nombor proton yang betul bagi atom X atau Y?

	Atom <i>Atom</i>	Nucleon number <i>Nombor nukleon</i>	Proton number <i>Nombor proton</i>
A	X	24	12
B	X	12	10
C	Y	18	18
D	Y	35	18

- 46 Diagram 14 shows plate number of Aminah's car which is fixed by using polythene dissolved in propanone as glue.
Rajah 14 menunjukkan nombor plat kereta Aminah yang telah dibetulkan dengan menggunakan politena yang dilarutkan dalam propanon sebagai gam.

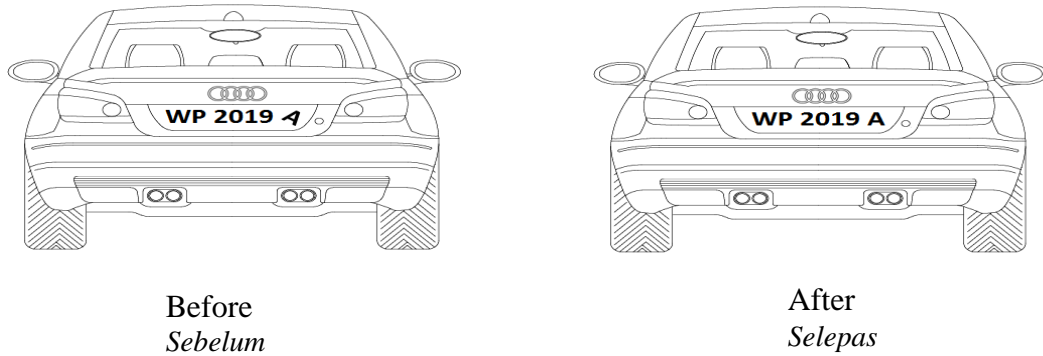


Diagram 14
Rajah 14

Which of the following substance can replace polythene?
Antara bahan berikut, yang manakah boleh menggantikan politena?

- A Latex
Lateks
- B Fibre glass
Gentian kaca
- C Kaolin
Kaolin
- D Silica
Silika

- 47 Diagram 15 shows the preparation of lead(II) chloride.
Rajah 15 menunjukkan penyediaan plumbum(II) klorida.

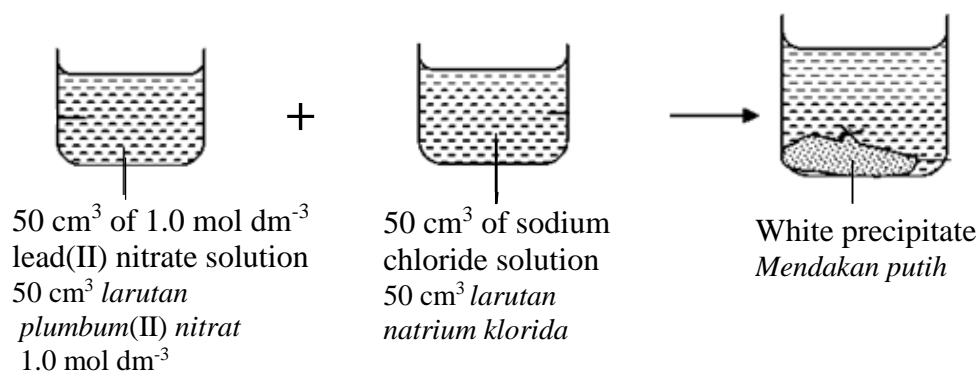


Diagram 15
Rajah 15

What is the concentration of the sodium chloride solution needed to react completely with lead(II) nitrate solution?

Berapakah kepekatan larutan natrium klorida yang diperlukan untuk bertindak balas secara lengkap dengan plumbum(II) nitrat?

- A 0.5 mol dm⁻³
B 1.0 mol dm⁻³
C 1.5 mol dm⁻³
D 2.0 mol dm⁻³
- 48 Diagram 16 shows the energy level diagram for the reaction between 50 cm³ of 0.2 mol dm⁻³ copper(II) nitrate solution and excess metal T.

[Specific heat capacity of solution = 4.2 J g⁻¹ °C⁻¹, density of solution = 1 g cm⁻³]

Rajah 16 menunjukkan gambar rajah aras tenaga bagi tindak balas antara 50 cm³ larutan kuprum(II) nitrat 0.2 mol dm⁻³ dengan logam T berlebihan.

[Muatan haba tentu larutan = 4.2 J g⁻¹ °C⁻¹, ketumpatan larutan = 1 g cm⁻³]

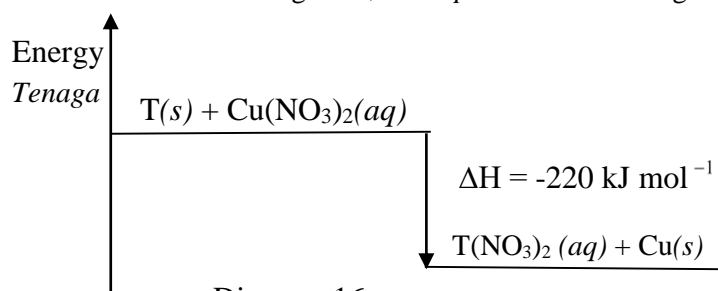


Diagram 16
Rajah 16

What is the temperature change in the reaction?

Apakah perubahan suhu bagi tindak balas tersebut?

- A 4.5 °C
B 7.5 °C
C 8.6 °C
D 10.5 °C

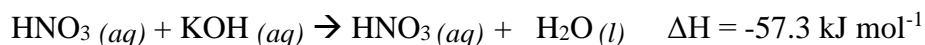
- 49 The following thermochemical equation represents the neutralization reaction between 25 cm³ nitric acid and 25 cm³ potassium hydroxide solution of the same molarity. The temperature of the mixture increased by 7.0 °C.

[Specific heat capacity of solution = 4.2 J g⁻¹ °C⁻¹, density of solution = 1 g cm⁻³]

Persamaan termokimia berikut mewakili tindak balas peneutralan di antara 25 cm³ asid nitrik dan 25 cm³ kalium hidroksida yang sama kemolaran.

Suhu campuran naik sebanyak 7.0 °C

[Muatan haba tentu larutan = 4.2 J g⁻¹ °C⁻¹, ketumpatan larutan = 1 g cm⁻³]



What is the molarity of both solutions?

Apakah kemolaran bagi kedua-dua larutan?

- A 0.52 mol dm⁻³
B 1.03 mol dm⁻³
C 2.10 mol dm⁻³
D 2.24 mol dm⁻³
- 50 Lactic acid produced by bacteria can cause sour taste in milk. It has similar empirical formula with ethanoic acid. Two molecules of lactic acid have the same mass as three molecules of ethanoic acid. What is the molecular formula of lactic acid?

Asid laktik yang dihasilkan oleh bakteria boleh menyebabkan susu berasa masam. Formula empirik asid laktik dan asid etanoik adalah sama.

Dua molekul asid laktik mempunyai jisim yang sama dengan tiga molekul asid etanoik.

Apakah formula molekul asid laktik.

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

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

- A C₃H₆O₃
B C₂H₄O₂
C CH₂O
D C₄H₁₂O₄

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

[Lihat halaman sebelah
SULIT

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. Each question is followed by four alternative answers **A, B, C** or **D**. For each question, choose **one** answer only. Blacken your answer on the objective answer sheet provided.
*Tiap-tiap soalan di ikuti oleh empat pilihan jawapan, iaitu **A, B, C** atau **D**. Bagi setiap soalan, pilih **satu** jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.*
4. 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 baharu.
5. The diagrams in the questions provided are not drawn to scale unless stated.
Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
6. You may use a scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik.