



**BAHAGIAN PENGURUSAN SEKOLAH BERASRAMA PENUH
DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PENDIDIKAN MALAYSIA**
<http://cikguadura.wordpress.com/>

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2013
SIJIL PELAJARAN MALAYSIA**

KIMIA

Kertas 1

1 jam 15 minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. *Kertas ini mengandungi 50 soalan.*
2. *Jawab semua soalan.*
3. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
4. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogramkan.*
5. *Tiap-tiap soalan diikuti oleh empat pilihan jawapan A , B , C dan D .
Pilih satu jawapan yang terbaik bagi setiap soalan dan hitamkan ruangan yang sepadan pada kertas jawapan objektif anda.*

- 1** Sublimation is a process when the solid change to gas.
Which substance undergoes sublimation?
Pemejalwapan adalah satu proses apabila pepejal bertukar kepada gas.
Bahan manakah mengalami pemejalwapan?
- A** Iodine
Iodin
- B** Carbon
Karbon
- C** Sulphur
Sulfur
- D** Bromine
Bromin
- 2** Which substance contains 6.02×10^{23} atoms?
Bahan manakah mengandungi 6.02×10^{23} atom?
- A** 1.0 mol of carbon dioxide gas
1.0 mol gas karbon dioksida
- B** 1.0 mol of hydrogen gas
1.0 mol gas hidrogen
- C** 1.0 mol of oxygen gas
1.0 mol gas oksigen
- D** 1.0 mol of helium gas
1.0 mol gas helium
- 3** Which elements are located in Group 1 in the Periodic Table of Elements?
Unsur-unsur manakah terletak dalam Kumpulan 1 dalam Jadual Berkala Unsur?
- A** Sodium and caesium
Natrium dan sesium
- B** Lithium and barium
Litium dan barium
- C** Potassium and calcium
Kalium dan kalsium
- D** Magnesium and sodium
Magnesium dan natrium

- 4 Which substance is an ionic compound?
Bahan manakah adalah sebatian ion?

- A Ethanol
Etanol
- B Ammonia
Ammonia
- C Sodium oxide
Natrium oksida
- D Sulphur dioxide
Sulfur dioksida

- 5 Diagram 1 shows the set-up of apparatus of a chemical cell.
Rajah 1 menunjukkan susunan radas bagi satu sel kimia.

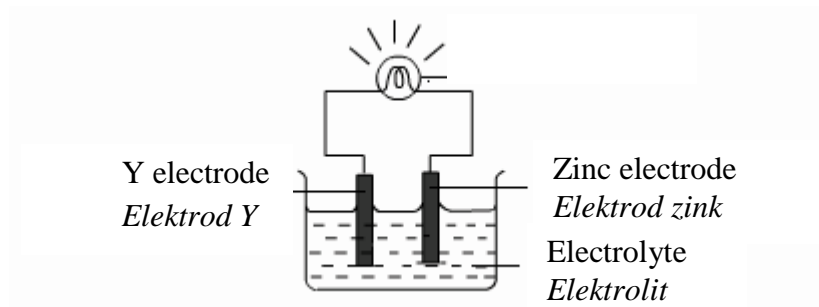


Diagram 1
Rajah 1

Electrode Y is the negative terminal of the cell.
What is Y?
Elektrod Y adalah negatif terminal bagi sel itu.
Apakah Y?

- A Iron
Ferum
- B Lead
Plumbum
- C Copper
Kuprum
- D Aluminium
Aluminium

- 6 Which of the following is a diprotic acid?
Antara berikut yang manakah asid diprotik?
- A Nitric acid
Asid nitrik
 - B Ethanoic acid
Asid etanoik
 - C Sulphuric acid
Asid sulfurik
 - D Hydrochloric acid
Asid hidroklorik
- 7 Which salt is insoluble in water?
Garam manakah tidak larut dalam air?
- A Lead(II) nitrate
Plumbum(II) nitrat
 - B Iron(II) chloride
Ferum(II) klorida
 - C Barium sulphate
Barium sulfat
 - D Sodium carbonate
Natrium karbonat
- 8 Trophy and medal are normally made up of bronze.
What is the composition of bronze?
*Piala dan pingat biasanya diperbuat daripada gangsa.
Apakah komposisi gangsa?*
- A Copper and tin
Kuprum dan stanium
 - B Copper and zinc
Kuprum dan zink
 - C Tin, copper and antimony
Stanum, kuprum dan antimony
 - D Iron, carbon and chromium
Ferum, karbon dan kromium

9 Which reaction has the lowest rate of reaction?
Tindak balas manakah mempunyai kadar paling rendah?

- A Precipitation of salt
Pemendakan garam
- B Combustion of alcohol
Pembakaran alkohol
- C Fermentation of glucose
Penapaian glukosa
- D Neutralisation of acid and alkali
Peneutralan asid dan alkali

10 Diagram 2 shows the particles arrangement for the change of state of matter.
Rajah 2 menunjukkan susunan zarah bagi pertukaran keadaan jirim.

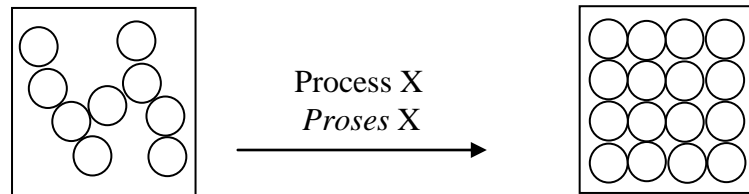


Diagram 2
Rajah 2

Which of the following is process X?
Antara berikut yang manakah adalah proses X?

- A Condensation
Kondensasi
- B Evaporation
Penyejatan
- C Sublimation
Pemejalwapan
- D Freezing
Pembekuan

- 11 Which statement is **incorrect** about unsaturated hydrocarbons?
*Pernyataan manakah yang **tidak betul** mengenai hidrokarbon tak tepu?*
- A Soluble in water
Larut dalam air
 - B Cannot conduct electricity at any state
Tidak mengkonduksi elektrik dalam sebarang keadaan
 - C Contain only carbon and hydrogen atoms
Mengandungi hanya atom karbon dan atom hidrogen
 - D Contain at least one double bond between carbon atoms
Mengandungi sekurang-kurangnya satu ikatan ganda dua antara atom-atom karbon
- 12 Which statement defines oxidation?
Pernyataan manakah mendefinisikan pengoksidaan?
- A Increase in oxidation number
Penambahan nombor pengoksidaan
 - B Gain of hydrogen
Penerimaan hydrogen
 - C Loss of oxygen
Kehilangan oksigen
 - D Gain of electron
Penerimaan electron
- 13 The reaction between silver nitrate solution and hydrochloric acid is an exothermic reaction.
Which statement is correct about the reaction?
Tindak balas antara larutan argentum nitrat dengan asid hidroklorik adalah tindak balas eksotermik.
Pernyataan manakah betul tentang tindak balas itu?
- A Heat is absorbed from surroundings
Haba diserap daripada persekitaran
 - B The products formed are more stable than reactants
Hasil tindak balas lebih stabil daripada bahan tindak balas
 - C The surroundings temperature increases during the reaction
Suhu persekitaran meningkat semasa tindak balas
 - D The energy content of reactants is lower than the energy content of products
Kandungan tenaga bahan tindak balas lebih rendah daripada kandungan tenaga hasil tindak balas

- 14 Diagram 3 shows a decorative glass which is used in the house. The glass has the following properties.

Rajah 3 menunjukkan satu kaca perhiasan yang digunakan di rumah. Kaca itu mempunyai ciri-ciri berikut.



Diagram 3
Rajah 3

Which of the following glass has the above properties?

Kaca manakah mempunyai ciri-ciri seperti di atas?

- A Fused glass
Kaca silika terlakur
 - B Soda-lime glass
Kaca soda kapur
 - C Borosilicate glass
Kaca borosilikat
 - D Lead crystal glass
Kaca plumbum Kristal
- 15 What is the function of aspartame?
Apakah fungsi aspartam?
- A Stabiliser
Penstabil
 - B Flavouring
Perisa
 - C Preservative
Pengawet
 - D Antioxidant
Antipengoksida

- 16 Diagram 4 shows the set-up of apparatus for an experiment to determine the empirical formula of magnesium oxide.

Rajah 4 menunjukkan susunan radas bagi satu eksperimen untuk menentukan formula empirik magnesium oksida.

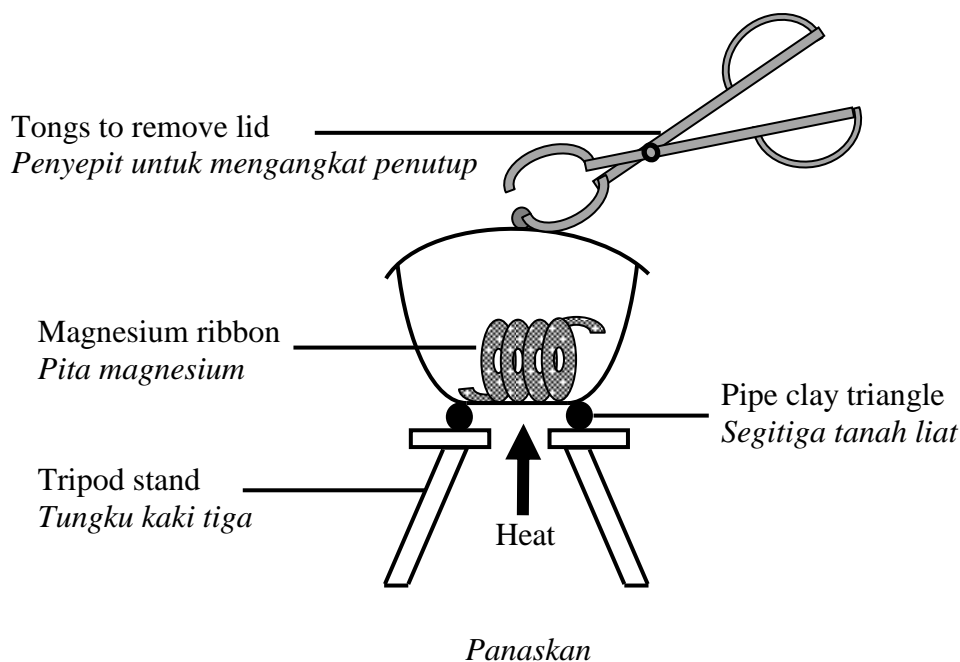


Diagram 4
Rajah 4

The lid of crucible must be lifted at intervals during the heating process.

What is the reason for this action?

Penutup mangkuk pijar perlu diangkat sekali sekala semasa proses pemanasan.

Apakah sebab tindakan ini diambil?

- A** To get the accurate mass of magnesium oxide
Untuk mendapatkan jisim yang tepat bagi magnesium oksida
- B** To allow oxygen enter into the crucible and react with magnesium
Untuk membenarkan oksigen masuk ke dalam mangkuk pijar dan bertindak balas dengan magnesium
- C** To ensure the complete reaction of magnesium to form magnesium oxide
Untuk memastikan tindak balas lengkap magnesium untuk membentuk magnesium oksida
- D** To release the white fumes that produce from combustion to the surroundings
Untuk membebaskan wasap putih yang terhasil daripada pembakaran ke persekitaran

- 17 Which isotope is used in radiotherapy for the treatment of cancer?
Isotop manakah digunakan dalam radioterapi untuk mengubati penyakit kanser?
- A Cobalt-60
Kobalt-60
- B Sodium-24
Natrium-24
- C Carbon-14
Karbon-14
- D Phosphorus-32
Fosforus-32
- 18 Element M forms two different chlorides, MCl_2 and MCl_3 .
What is M ?
*Unsur M membentuk dua jenis klorida, MCl_2 dan MCl_3 .
Apakah M?*
- A Iron
Ferum
- B Zinc
Zink
- C Copper
Kuprum
- D Lead
Plumbum
- 19 Which substance is an electrolyte?
Bahan manakah adalah elektrolit?
- A Glucose
Glukosa
- B Naphthalene
Naftalena
- C Ethanoic acid
Asid etanoik
- D Ethyl ethanoate
Etil etanoat

- 20 Diagram 5 shows the set-up of apparatus to investigate the electrical conductivity of substance P.

Rajah 5 menunjukkan susunan radas untuk mengkaji kekonduksian elektrik bagi bahan P.

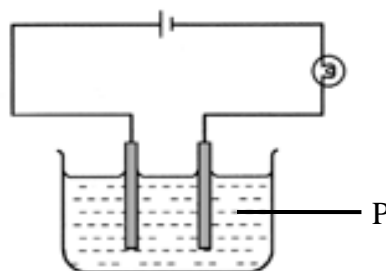


Diagram 5

Rajah 5

Substance P lights up the bulb because

Bahan P menyalakan mentol kerana

- A soluble in water.
larut dalam air.
 - B has high melting point.
mempunyai takat lebur yang tinggi.
 - C has free moving ions.
mengandungi ion-ion yang bebas bergerak.
 - D has strong electrostatic forces between ions.
mempunyai daya elektrostatik yang kuat antara ion-ion.
- 21 Which of the following is correct about weak alkalis?
- Antara berikut yang manakah betul mengenai alkali lemah?*
- A Unable to neutralise acid
Tidak boleh meneutralkan asid
 - B The pH value is less than 7
Nilai pH kurang daripada 7
 - C Able to change blue litmus paper to red
Boleh menukarkan kertas litmus biru ke merah
 - D Ionise partially in water to produce hydroxide ion
Mengion separa dalam air untuk menghasilkan ion hidroksida

22 Which reactants are suitable to prepare copper(II) sulphate?
Bahan manakah sesuai untuk menyediakan kuprum(II) sulfat?

- A** Copper and sulphuric acid
Kuprum dan asid sulfurik
- B** Copper(II) carbonate and sulphuric acid
Kuprum(II) karbonat dan asid sulfurik
- C** Copper(II) oxide and sodium sulphate
Kuprum(II) oksida dan natrium sulfat
- D** Copper(II) nitrate and sodium sulphate
Kuprum(II) nitrat dan natrium sulfat

23 A substance has the following properties:
Satu bahan mempunyai ciri-ciri berikut:

- Hard and opaque
Keras dan legap
- Inert towards chemicals
Lengai terhadap bahan kimia
- Good insulator of heat and electricity
Penebat haba dan elektrik yang baik

Which substance has the above properties?
Bahan manakah mempunyai ciri-ciri di atas?

- A** Ceramic
Seramik
- B** Polymer
Polimer
- C** Metal
Logam
- D** Glass
Kaca

- 24 The higher the concentration of reactant, the higher the rate of reaction.
Which statement explains why the rate of reaction increases?
*Apabila kepekatan bahan tindak balas meningkat, kadar tindak balas meningkat.
Pernyataan manakah menerangkan mengapa kadar tindak balas meningkat?*
- A Kinetic energy of the particles increases
Tenaga kinetik zarah-zarah bertambah
- B The total surface area of the particles increases
Jumlah luas permukaan zarah-zarah bertambah
- C The number of particles per unit volume increases
Bilangan zarah-zarah per unit isi padu bertambah
- D More particles are able to achieve lower activation energy
Lebih banyak zarah-zarah berupaya untuk mencapai tenaga pengaktifan yang lebih rendah
- 25 Diagram 6 shows the structural formula of substance X.
Rajah 6 menunjukkan formula struktur bagi bahan X.

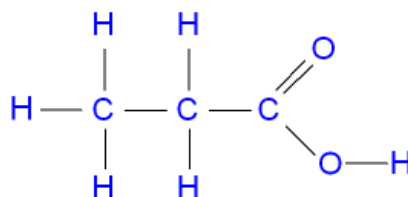


Diagram 6
Rajah 6

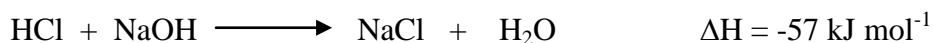
Which of the following are properties of substance X?
Antara berikut yang manakah sifat-sifat bahan X?

- I Reacts with copper to produce hydrogen gas
Bertindak balas dengan kuprum menghasilkan gas hidrogen
- II Colourless liquid at room temperature
Cecair tidak berwarna pada suhu bilik
- III Reacts with alcohol to form an ester
Bertindak balas dengan alkohol menghasilkan sejenis ester
- IV Does not dissolve in water
Tidak larut di dalam air
- A I and II
I dan II
- B I and IV
I dan IV
- C II and III
II dan III
- D III and IV
III dan IV

26 Which substance accepts electron?
Bahan manakah menerima elektron?

- A Dehydrating agent
Agen pengontangan
- B Emulsifying agent
Agen pengemulsian
- C Oxidising agent
Agen pengoksidaan
- D Reducing agent
Agen penurunan

27 The thermochemical equation represents the neutralisation between hydrochloric acid, HCl and sodium hydroxide, NaOH solution.
Persamaan termokimia mewakili tindak balas peneutralan antara asid hidroklorik, HCl dan larutan natrium hidroksida, NaOH.



Which substance is suitable to replace hydrochloric acid to obtain the same ΔH value?
Bahan manakah yang sesuai menggantikan asid hidroklorik untuk memperoleh nilai ΔH yang sama?

- A Nitric acid
Asid nitric
- B Ethanoic acid
Asid etanoik
- C Carbonic acid
Asid karbonik
- D Phosphoric acid
Asid fosforik

- 28 Diagram 7 shows the elements in Period 3 of the Periodic Table of the Elements.
Rajah 7 menunjukkan unsur-unsur dalam Kala 3 Jadual Berkala Unsur.

| | | | | | | | |
|----|----|----|----|---|---|----|----|
| Na | Mg | Al | Si | P | S | Cl | Ar |
|----|----|----|----|---|---|----|----|

Diagram 7

Rajah 7

Which of the following statement is correct?

Antara pernyataan berikut yang manakah betul?

- A** Argon is denser than magnesium
Argon lebih tumpat daripada magnesium
- B** Chlorine is more electronegative than sulphur
Klorin lebih elektronegatif daripada sulfur
- C** Sodium has smaller atomic size than aluminium
Natrium mempunyai saiz atom lebih kecil daripada aluminium
- D** Magnesium has lower melting point than phosphorus
Magnesium mempunyai takat lebur lebih rendah daripada fosforus
- 29 Which equations represent a neutralisation reaction?
Persamaan manakah mewakili tindak balas peneutralan?

- I** $\text{MgO} + 2\text{HCl} \longrightarrow \text{MgCl}_2 + \text{H}_2\text{O}$
- II** $\text{CH}_3\text{COOH} + \text{KOH} \longrightarrow \text{CH}_3\text{COOK} + \text{H}_2\text{O}$
- III** $\text{Mg} + 2\text{AgNO}_3 \longrightarrow \text{Mg}(\text{NO}_3)_2 + 2\text{Ag}$
- IV** $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \longrightarrow \text{BaSO}_4 + 2\text{HCl}$
- A** I and II
I dan II
- B** II and III
II dan III
- C** I and IV
I dan IV
- D** III and IV
III dan IV

- 30 Diagram 8 shows a cut apple turns brown after 20 minutes.

Rajah 8 menunjukkan sepotong epal yang bertukar perang selepas 20 minit.

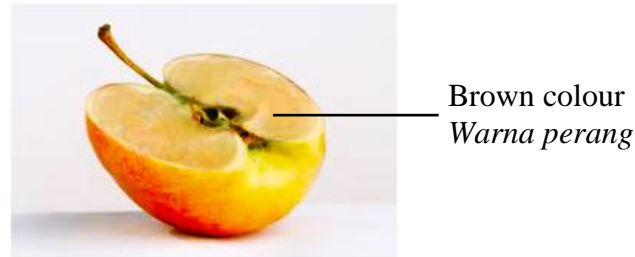


Diagram 8

Rajah 8

Which of the following is the reason why the cut apple turns brown and the type of food additive used to prevent it?

Antara berikut yang manakah sebab mengapa epal yang dipotong itu bertukar perang dan jenis bahan tambah makanan yang digunakan untuk mengelakkannya?

| | <u>Reason</u> <i>Sebab</i> | <u>Food additive</u> <i>Bahan tambah makanan</i> |
|----------|--|---|
| A | The growth of microorganisms <i>Pembiakan mikroorganisma</i> | Preservative <i>Pengawet</i> |
| B | Oxidation occur <i>Pengoksidaan berlaku</i> | Antioxidant <i>Antipengoksida</i> |
| C | Concentration of salt is high <i>Kepekatan garam adalah tinggi</i> | Flavouring <i>Perisa</i> |
| D | Azo compound presents in the apple <i>Sebatian azo wujud dalam epal</i> | Colouring <i>Pewarna</i> |

- 31 A woman is always sad and anxious.

Which medicine is suitable to treat this patient?

Seorang wanita selalu sedih dan gelisah.

Ubat manakah paling sesuai untuk mengubati pesakit itu?

- A** Chlorpromazine
Klorpromazin
- B** Tranquilizer
Trankuilizer
- C** Penicillin
Penisilin
- D** Aspirin
Aspirin

- 32 Diagram 9 shows the the electron arrangement of a compound formed between carbon, C and element Y. The letter Y is not the actual symbol of the element.

Rajah 9 menunjukkan susunan elektron bagi sebatian yang terbentuk antara karbon, C dan unsur Y. Huruf Y bukan simbol sebenar unsur itu.

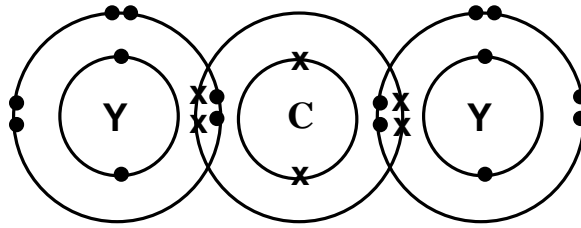


Diagram 9

Rajah 9

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

Apakah formula bagi sebatian yang terbentuk apabila litium bertindak balas dengan Y?

- A LiY
 B LiY₂
 C LiY₄
 D Li₂Y
- 33 Atoms X and Y are isotopes. The nucleon number of atom Y is 37 and it has 20 neutrons. What is the electron arrangement of atom X?

Atom X dan Y adalah isotop. Nombor nukleon atom Y adalah 37 dan ia mempunyai 20 neutron.

Apakah susunan elektron atom X?

- A 2.7
 B 2.8.7
 C 2.8.2
 D 2.8.8.2

- 34 Diagram 10 shows an energy profile, X for one of the stage in the production of sulphuric acid through Contact Process.

Rajah 10 menunjukkan profil tenaga, X bagi salah satu peringkat dalam penghasilan asid sulfurik melalui Proses Sentuh.

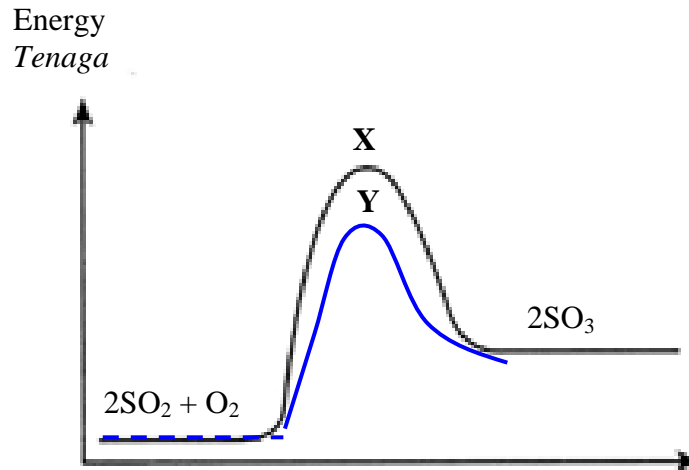


Diagram 10
Rajah 10

What is the change needed to be done to obtain curve Y?

Apakah perubahan yang perlu dilakukan untuk mendapat lengkung Y?

- A Heat the reactants at 450°C
Panaskan bahan tindak balas pada suhu 450°C
- B Compress the reactants at 1 atm
Mampatkan bahan tindak balas pada tekanan 1 atm
- C Increase the concentration of reactants
Tingkatkan kepekatan bahan tindak balas
- D Heat the reactants with the presence of vanadium(V) oxide
Panaskan bahan tindak balas dengan kehadiran vanadium(V) oksida

- 35 Diagram 11 shows the apparatus set-up for the electrolysis of sodium nitrate solution, NaNO_3 using carbon electrodes.

Rajah 11 menunjukkan susunan radas bagi elektrolisis larutan natrium nitrat, NaNO_3 menggunakan elektrod-elektrod karbon.

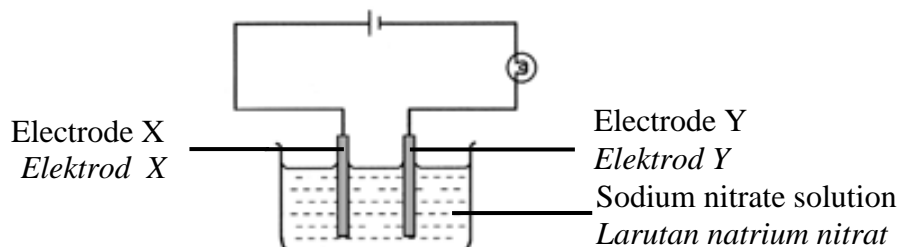


Diagram 11

Rajah 11

What are the products at electrodes X and Y?

Apakah hasil tindak balas pada elektrod X dan Y?

| | <u>X</u> | <u>Y</u> |
|----------|-------------------------------------|-------------------------------------|
| A | Oxygen gas <i>Gas oksigen</i> | Sodium <i>Natrium</i> |
| B | Hydrogen gas <i>Gas hidrogen</i> | Oxygen gas <i>Gas oksigen</i> |
| C | Nitrogen gas <i>Gas nitrogen</i> | Sodium <i>Natrium</i> |
| D | Oxygen gas <i>Gas oksigen</i> | Hydrogen gas <i>Gas hidrogen</i> |

- 36 Copper(II) sulphate solution is electrolysed using carbon electrodes.

Which half-equations represent the reactions at the anode and the cathode?

Larutan kuprum(II) sulfat dielektrolisiskan menggunakan elektrod-elektrod karbon.

Setengah persamaan manakah mewakili tindak balas di anod dan di katod?

| | <u>Anode</u> <i>Anod</i> | <u>Cathode</u> <i>Katod</i> |
|----------|--|--|
| A | $\text{Cu}^{2+} + 2e \longrightarrow \text{Cu}$ | $4\text{OH}^- \longrightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4e$ |
| B | $4\text{OH}^- \longrightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4e$ | $2\text{H}^+ + 2e \longrightarrow \text{H}_2$ |
| C | $4\text{OH}^- \longrightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4e$ | $\text{Cu}^{2+} + 2e \longrightarrow \text{Cu}$ |
| D | $2\text{H}^+ + 2e \longrightarrow \text{H}_2$ | $4\text{OH}^- \longrightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4e$ |

- 37 Diagram 12 shows the set-up of apparatus for the decomposition of compound Q.
Rajah 12 menunjukkan susunan radas bagi penguraian sebatian Q.

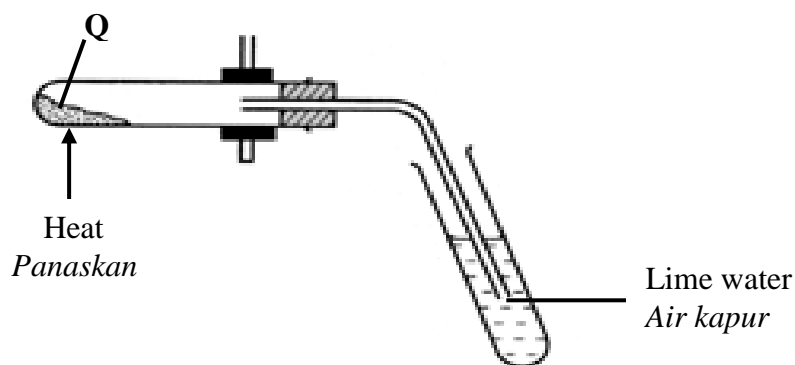


Diagram 12
Rajah 12

When Q is heated, the lime water turns milky.
What is compound Q?
Apabila Q dipanaskan, air kapur bertukar keruh.
Apakah sebatian Q?

- A** Ammonium carbonate
Ammonium karbonat
- B** Potassium carbonate
Kalium karbonat
- C** Sodium carbonate
Natrium karbonat
- D** Zinc carbonate
Zink karbonat
- 38 A farmer discovered that his plants were not growing well because the soil was acidic.
Which substance is used to overcome the problem?
Seorang petani mendapati tanamannya tidak tumbuh dengan subur kerana tanahnya berasid.
Bahan manakah digunakan untuk mengatasi masalah tersebut?
- A** Zinc oxide
Zink oksida
- B** Calcium oxide
Kalsium oksida
- C** Potassium hydroxide
Kalium hidroksida
- D** Magnesium hydroxide
Magnesium hidroksida

- 39 Diagram 13 shows curve I in a graph of volume of gas released against time for the reaction between excess zinc powder and 100 cm^3 of 1.0 mol dm^{-3} hydrochloric acid, HCl. Which of the following conditions represents curve II?

Rajah 13 menunjukkan lengkung I dalam graf isi padu gas terbebas melawan masa bagi tindak balas antara serbuk zink berlebihan dengan 100 cm^3 asid hidroklorik, HCl 1.0 mol dm^{-3} . Antara berikut keadaan manakah mewakili lengkung II?

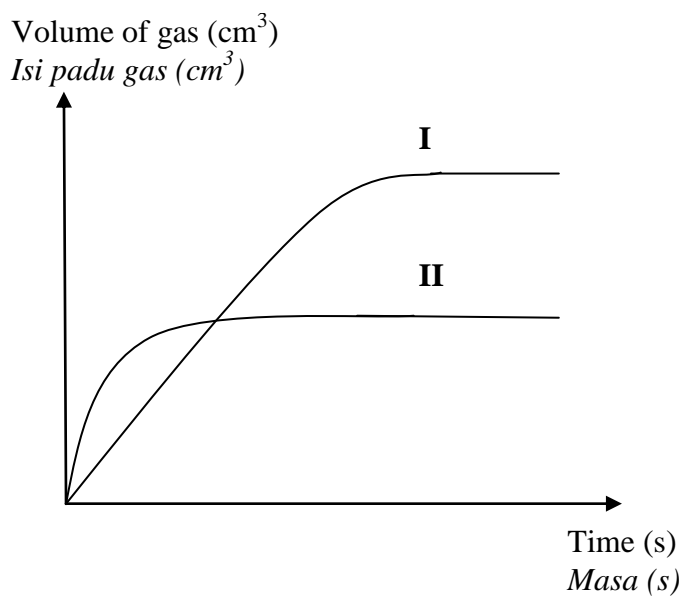
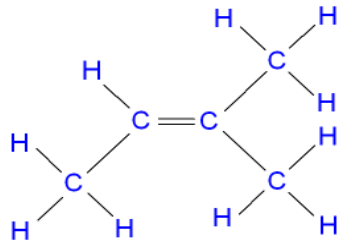


Diagram 13
Rajah 13

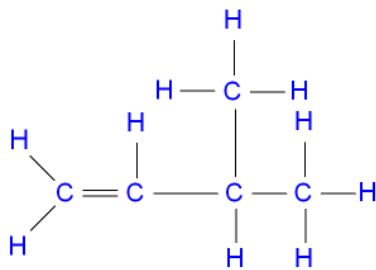
| | Concentration of HCl (mol dm^{-3}) <i>Kepekatan HCl (mol dm^{-3})</i> | Volume of HCl (cm^3) <i>Isi padu HCl (cm^3)</i> |
|---|---|---|
| A | 0.5 | 100 |
| B | 1.0 | 50 |
| C | 2.0 | 50 |
| D | 2.0 | 25 |

- 40 Which of the following shows the structural formula for 2-methylbut-2-ene.
Antara berikut yang manakah menunjukkan formula struktur bagi 2-metilbut-2-ena.

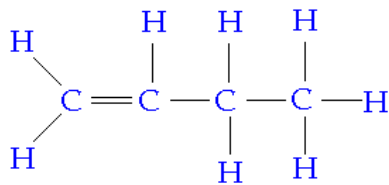
A



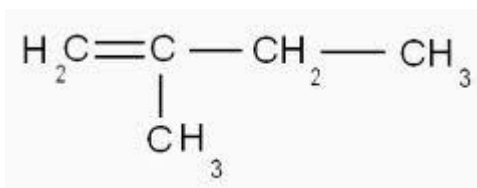
B



C



D



- 41 Diagram 14 shows two experiments to investigate the effect of metals X and Y on the rusting of iron.

Rajah 14 menunjukkan dua eksperimen untuk mengkaji kesan logam X dan Y terhadap pengurangan besi.

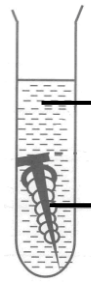
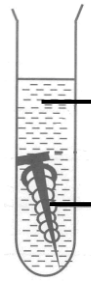
| Experiment <i>Eksperimen</i> | Observation <i>Pemerhatian</i> |
|--|--|
|  <p>Jelly solution + potassium hexacyanoferrate(III) <i>Larutan agar + kalium heksasianoferat(III)</i></p> <p>Iron nail and metal X <i>Paku besi dan logam X</i></p> | <p>No change <i>Tiada perubahan</i></p> |
|  <p>Jelly solution + potassium hexacyanoferrate(III) <i>Larutan agar + kalium heksasianoferat(III)</i></p> <p>Iron nail and metal Y <i>Paku besi dan logam Y</i></p> | <p>Blue spot formed <i>Tompok biru terbentuk</i></p> |

Diagram 14

Rajah 14

Arrange X, Y and iron in order of increasing tendency to release electrons.

Susun X, Y dan besi dalam urutan pertambahan kecenderungan melepaskan elektron.

- A** Iron , X , Y
Besi , X , Y
- B** X , iron , Y
X , besi , Y
- C** X , Y , iron
X , Y , besi
- D** Y , iron , X
Y , besi , X

- 42 Table 1 shows temperature change obtained for two set of experiments.
Jadual 1 menunjukkan perubahan suhu yang didapati bagi dua set eksperimen.

| Set <i>Set</i> | Reactants <i>Bahan tindak balas</i> | Temperature change (°C) <i>Perubahan suhu (°C)</i> |
|-------------------|---|---|
| I | Magnesium powder + 25 cm ³ of 0.2 mol dm ⁻³ copper(II) sulphate solution <i>Serbuk magnesium + 25 cm³ larutan kuprum(II) sulfat 0.2 mol dm⁻³</i> | θ |
| II | Magnesium powder + 25 cm ³ of copper(II) sulphate solution 0.4 mol dm ⁻³ <i>Serbuk magnesium + 25 cm³ larutan kuprum(II) sulfat 0.4 mol dm⁻³</i> | x |

Table 1
Jadual 1

What is the value of x ?
Apakah nilai x ?

- A θ
 B 2θ
 C 0.5θ
 D 0.25θ
- 43 Element X is located below potassium in the Periodic Table of Elements.
 X is not the actual symbol of the element.
 Which statement is correct about element X?
Unsur X berada di bawah kalium dalam Jadual Berkala Unsur.
X bukan simbol sebenar unsur itu.
Pernyataan manakah betul tentang unsur X?
- A X is less dense than potassium
X kurang tumpat daripada kalium
 B X is less reactive than potassium
X kurang reaktif daripada kalium
 C X atom is smaller than potassium atom
Atom X lebih kecil daripada atom kalium
 D X is more electropositive than potassium
X lebih elektropositif daripada kalium

- 44 Table 2 shows the proton number of four atoms of elements.
Jadual 2 menunjukkan nombor proton bagi empat atom unsur.

| Atom <i>Atom</i> | W | X | Y | Z |
|---------------------------------------|----|---|----|----|
| Proton number <i>Nombor proton</i> | 12 | 8 | 18 | 17 |

Table 2

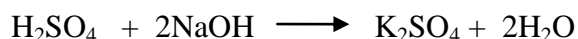
Jadual 2

Which elements react to form an ionic compound?

Unsur-unsur manakah bertindak balas untuk membentuk sebatian ion?

- I** W and X
W dan X
- II** W and Z
W dan Z
- III** X and Y
X dan Y
- IV** X and Z
X dan Z
- A** I and II
I dan II
- B** I and III
I dan III
- C** II and IV
II dan IV
- D** III and IV
III dan IV
- 45 What is the number of atoms in 8.5 g of ammonia gas, NH_3 ?
 [Molar mass of $\text{NH}_3 = 17$; Avogadro constant = $6.02 \times 10^{23} \text{ mol}^{-1}$]
Berapakah bilangan atom dalam 8.5 g ammonia gas, NH_3 ?
[Jisim molar $\text{NH}_3 = 17$; Pemalar Avogadro = $6.02 \times 10^{23} \text{ mol}^{-1}$]
- A** $0.5 \times 6.02 \times 10^{23}$
- B** $0.5 \times 4 \times 6.02 \times 10^{23}$
- C** $8.5 \times 6.02 \times 10^{23}$
- D** $8.5 \times 4 \times 6.02 \times 10^{23}$

- 46 The equation represents the reaction between sulphuric acid and sodium hydroxide.
Persamaan mewakili tindak balas antara asid sulfurik dan natrium hidroksida.



What is the volume of 1.0 mol dm^{-3} sodium hydroxide solution needed to neutralise 25.0 cm^3 of 1.0 mol dm^{-3} sulphuric acid?

Berapakah isipadu larutan natrium hidroksida 1.0 mol dm^{-3} yang diperlukan untuk meneutralkan 25.0 cm^3 asid sulfurik 1.0 mol dm^{-3} ?

- A 12.5 cm^3
 B 25.0 cm^3
 C 50.0 cm^3
 D 75.0 cm^3
- 47 Table 3 shows the volume of oxygen gas collected in the decomposition of hydrogen peroxide.
Jadual 3 menunjukkan isi padu gas oksigen terkumpul dalam penguraian hidrogen peroksida.

| | | | | | | | | |
|--|-----|-----|------|------|------|------|------|------|
| Time (s) <i>Masa (s)</i> | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 |
| Volume of oxygen (cm^3) <i>Isi padu oksigen (cm^3)</i> | 0.0 | 7.0 | 14.5 | 20.5 | 26.2 | 30.5 | 30.5 | 30.5 |

Table 3

Jadual 3

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

Berapakah kadar tindak balas purata dalam minit ke-2?

- A $0.254 \text{ cm}^3 \text{ s}^{-1}$
 B $0.218 \text{ cm}^3 \text{ s}^{-1}$
 C $0.203 \text{ cm}^3 \text{ s}^{-1}$
 D $0.195 \text{ cm}^3 \text{ s}^{-1}$

- 48 Diagram 15 shows a structural formula of an ester propyl ethanoate.
Rajah 15 menunjukkan formula struktur bagi satu ester propil etanoat.

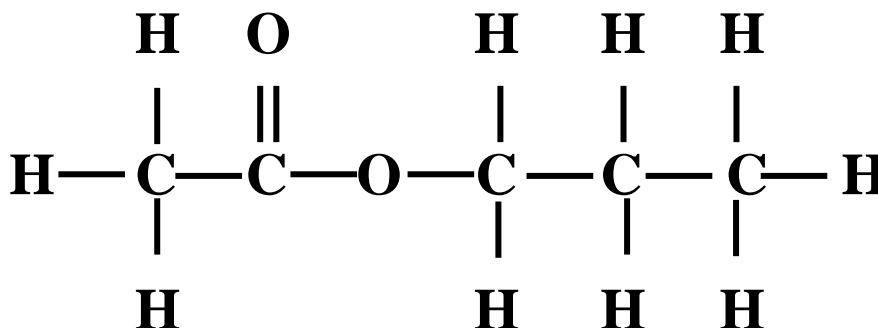


Diagram 15
Rajah 15

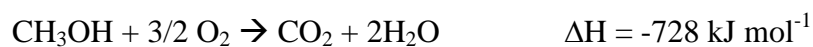
What are the structural formula of alcohol and carboxylic acid used to prepare the ester?
Apakah formula struktur alkohol dan asid karbosilik yang digunakan untuk menyediakan ester itu?

| | Alcohol <i>Alkohol</i> | Carboxylic acid <i>Asid karbosilik</i> |
|----------|--|---|
| A | CH ₃ CH ₂ OH | CH ₃ COOH |
| B | CH ₃ CH ₂ CH ₂ OH | CH ₃ COOH |
| C | CH ₃ CH ₂ CH ₂ OH | CH ₃ CH ₂ COOH |
| D | CH ₃ CH ₂ OH | CH ₃ CH ₂ COOH |

- 49 R is located between aluminium and iron in the reactivity series of metals.
 Which oxide is **not** reduced by R?
*R terletak antara magnesium dan ferum dalam siri kereaktifan logam.
 Oksida manakah **tidak** diturunkan oleh R?*

- A Copper(II) oxide
Kuprum(II) oksida
 B Magnesium oxide
Magnesium oksida
 C Silver oxide
Argentum oksida
 D Tin(II) oxide
Stanium(II) oksida

- 50 The thermochemical equation represents the combustion of methanol, CH₃OH.
Persamaan termokimia mewakili pembakaran methanol, CH₃OH.



What is the mass of methanol needed to raise the temperature of 250 cm³ of water by 27.8°C?

[Molar mass of CH₃OH = 32; Specific heat capacity of water = 4.2 J g⁻¹ °C⁻¹;
Density of water = 1 g cm⁻³]

Berapakah jisim metanol yang diperlukan untuk menaikkan suhu 250 cm³ air sebanyak 27.8 °C?

*[Jisim molar CH₃OH = 32; Muatan haba tentu air = 4.2 J g⁻¹ °C⁻¹;
Ketumpatan air = 1 g cm⁻³]*

- A 2.56 g
- B 1.88 g
- C 1.28 g
- D 0.79 g

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END OF QUESTION PAPER
KERTAS SOALAN TAMAT