4541/1
KIMIA
KERTAS1
MASA 1 1/4 JAM

MAJLIS PENGETUA SEKOLAH MENENGAH
(CAWANGAN PULAU PINANG)

MODUL LATIHAN BERFOKUS SPM 2020

KIMIA
KERTAS1
1 JAM 15 MINIT

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa
2. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu

MAKLUMAT UNTUK CALON

1. Kertas soalan ini mengandungi 50 soalan
2. Jawab semua soalan.

Answer **all** questions
*Jawab **semua** soalan*

1 What are the three states of matter in Diagram 1?
Apakah tiga keadaan jirim dalam Rajah 1?

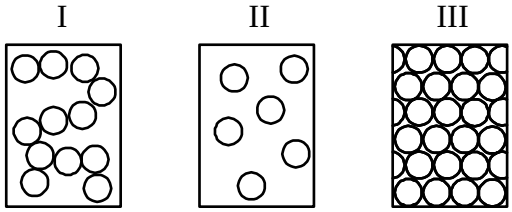


Diagram 1
Rajah 1

	I	II	III
A	Solid *Pepejal*	Gas *Gas*	Liquid *Cecair*
B	Gas *Gas*	Liquid *Cecair*	Solid *Pepejal*
C	Liquid *Cecair*	Solid *Pepejal*	Gas *Gas*
D	Liquid *Cecair*	Gas *Gas*	Solid *Pepejal*

2. The molecular formula of sodium nitrate and magnesium chloride are $NaNO_3$ and $MgCl_2$ respectively. What is the molecular formula of magnesium nitrate?
Formula molekul bagi natrium nitrat dan magnesium klorida adalah $NaNO_3$ dan $MgCl_2$ masing-masing. Apakah formula molekul bagi magnesium nitrat?

A $MgNO_2$
B $Mg(NO_3)_2$
C Mg_2NO_3
D $Mg_2(NO_2)_3$

3 Elements are arranged in the modern Periodic Table based on their
Unsur-unsur disusun dalam Jadual Berkala moden berdasarkan

A Atomic radius
Jejari atom

B Nucleon number
Nombor nucleon

C Proton number
Nombor proton

D Number of neutrons
Bilangan neutron

4. Diagram 2 shows a type of medicine used by gastric patient.
Rajah 2 menunjukkan sejenis ubat yang digunakan oleh pesakit gastrik.

Diagram 2
Rajah 2

Which of the following elements are present in the compound shown in Diagram 2?
Manakah antara unsur-unsur berikut hadir dalam sebatian yang ditunjukkan dalam Rajah 2?

A Calcium and carbon
Kalsium dan karbon

B Calcium and nitrogen
Kalsium dan nitrogen

C Sodium and carbon
Natrium dan karbon

D Sodium and nitrogen
Natrium dan nitrogen

5 Diagram 3 shows the set up of the apparatus for electrolysis of solution Y.
Rajah 3 menunjukkan susunan radas bagi elektrolisis larutan Y.

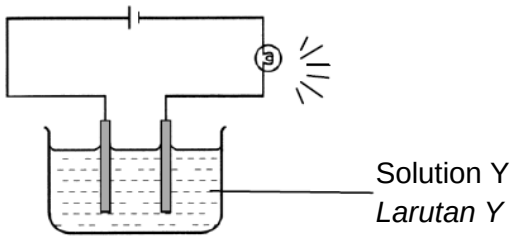


Diagram 3
Rajah 3

Which of the following compounds could be used as solution Y?
Manakah antara sebatian berikut boleh digunakan sebagai larutan Y?

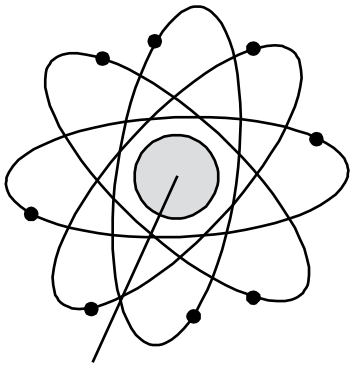
A Propene, C_3H_6
Propena, C_3H_6

B Glucose, $C_6H_{12}O_6$
Glukosa, $C_6H_{12}O_6$

C Zinc sulphate, $ZnSO_4$
Zink sulfat, $ZnSO_4$

D Silver chloride, AgCl
Argentum klorida, AgCl

6 Diagram 4 below shows a model of the atom that was proposed by a scientist. Name the scientist who proposed the model.
Rajah 4 di bawah menunjukkan satu model atom yang diperkenalkan oleh seorang saintis. Namakan saintis yang memperkenalkan model ini.



nucleus (protons + neutrons)
nukleus (proton + neutron)

Diagram 4
Rajah 4

A J. J. Thomson.
B James Chadwick.
C Ernest Rutherford.
D Niels Bohr.

7 Which of the following is a diprotic acid?
Manakah antara berikut adalah asid dwibes?

A Phosphorus acid
Asid fosforik

B Carbonic acid
Asid karbonik

C Ethanoic acid
Asid etanoik

D Nitric acid
Asid nitrik

8 Sulphuric acid, H_2SO_4 is produced in industry through Contact Process.
What is the catalyst used in Contact Process?
Asid sulfurik, H_2SO_4 dihasilkan dalam industri melalui Proses Sentuh.
Apakah mangkin yang digunakan dalam Proses Sentuh?

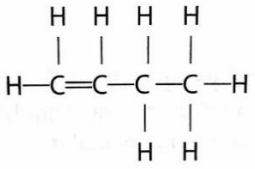
A Iron
*Bes*i

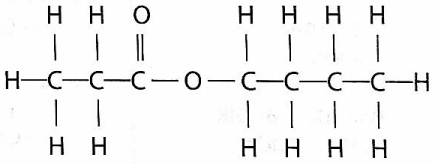
B Platinum
Platinum

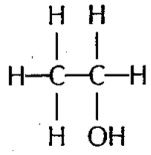
C Vanadium(V) oxide
Vanadium(V) oksida

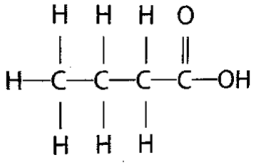
D Manganese(IV) oxide
Mangan(IV) oksida

9 Which of the following is the structural formula of a carboxylic acid?
Manakah antara berikut merupakan formula struktur bagi suatu asid karboksilik?

A 

B 

C 

D 

10 What salt is soluble in water?
Garam manakah yang larut di dalam air?

A Magnesium carbonate
Magnesium karbonat

B Silver chloride
Argentum klorida

C Aluminium nitrate
Aluminium nitrat

D Calcium sulphate
Kalsium sulfat

11 Which of the following is an endothermic reaction?
Manakah antara berikut adalah tindak balas endotermik?

A $Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$

B $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

C $CaCO_3 \rightarrow CaO + CO_2$

D $NaOH + HCl \rightarrow NaCl + H_2O$

12 What is the colour of copper(II) carbonate powder?
Apakah warna serbuk kuprum(II) karbonat?

A Green
Hijau

B Blue
Biru

C Black
Hitam

D Brown
Perang

13 Diagram 5 shows a chemical cell using magnesium and metal X .
Rajah 5 menunjukkan satu sel kimia menggunakan magnesium dan logam X.

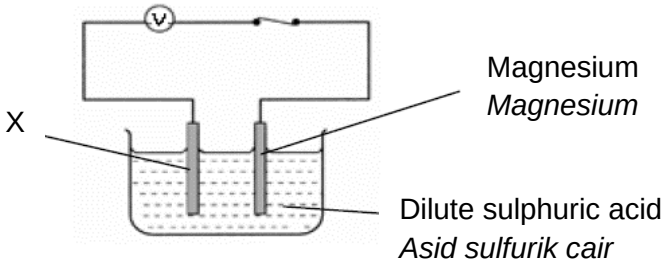


Diagram 5
Rajah 5

Which of the following represents X in order to give the highest voltmeter reading?
Manakah antara berikut mewakili X untuk menghasilkan bacaan voltmeter yang tertinggi?

A Iron
Ferum
B Zinc
Zink
C Lead
Plumbum
D Copper
Kuprum

14 The following equation represents the oxidation of zinc atom.
Persamaan berikut mewakili pengoksidaan atom zink.

$$Zn \rightarrow Zn^{2+} + 2e$$

What is meant by oxidation based on the equation given?
Apa yang dimaksudkan dengan pengoksidaan berdasarkan persamaan yang diberi?

A Electrons are received by zinc ion
Elektron diterima oleh ion zink
B Electrons are donated by zinc ion
Elektron didermakan oleh ion zink
C Electrons are received by zinc atom
Elektron diterima oleh atom zink
D Electrons are donated by zinc atom
Elektron didermakan oleh atom zink

15 Which pair is matched correctly?
Pasangan manakah yang dipadankan dengan betul?

	Alloy ***Aloi***	**Major Component** ***Komponen Utama***
A	Brass *Loyang*	Copper *Kuprum*
B	Pewter *Piuter*	Zinc *Zink*
C	Bronze *Gangsa*	Tin *Stanum*
D	Steel *Keluli*	Carbon *Karbon*

16 When sodium thiosulphate solution react with acid, gas Y with pungent smell is produced. Name the gas Y
Apabila larutan natrium tiosulfat bertindak balas dengan asid, gas Y yang berbau sengit dibebaskan. Namakan gas Y.

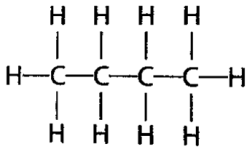
A Sulphur
Sulfur

B Oxygen
Oksigen

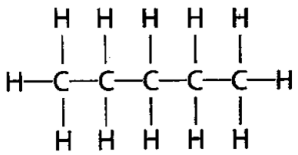
C Sulphur dioxide
Sulfur dioksida

D Sodium dioxide
Natrium dioksida

17 Diagram 6 shows the structural formulae of two hydrocarbons.
Rajah 6 menunjukkan formula struktur bagi dua hidrokarbon.



A



B

Diagram 6
Rajah 6

Which property of both compounds is similar?
Sifat manakah adalah sama bagi kedua-dua sebatian?

A Solubility
Keterlarutan

B Melting point
Takat lebur

C Molar mass
Jisim molar

D Density
Ketumpatan

18 Which pair is matched correctly?
Pasangan manakah yang dipadankan dengan betul?

	Soap ***Sabun***	**Detergent** ***Detergen***
A	Contains acid *Mengandungi asid*	Contains alkali *Mengandungi alkali*
B	Made from vegetable oil *Diperbuat daripada minyak sayuran*	Made from petroleum *Diperbuat daripada petroleum*
C	Effective in hard water *Berkesan dalam air liat*	Less effective in hard water *Kurang berkesan dalam air liat*
D	Does not form scum in hard water *Tidak membentuk kekat dalam air liat*	Forms scum in hard water *Membentuk kekat dalam air liat*

19 Element P and element Q are located in Group 2 and Group 17 in the Periodic Table respectively. Element P reacts with element Q to form a compound. What is the chemical formula of the compound?
Unsur P dan unsur Q masing-masing terletak dalam kumpulan 2 dan kumpulan 17 dalam Jadual Berkala. Unsur P bertindak balas dengan unsur Q untuk membentuk suatu sebatian. Apakah formula kimia bagi sebatian itu?

A PQ
B PQ_2
C P_2Q
D P_2Q_3

20 Which reaction produces the lowest heat of neutralisation?
Tindak balas manakah menghasilkan haba peneutralan paling rendah?

A $HCl + NaOH \rightarrow NaCl + H_2O$
B $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$
C $HCl + NH_3 \rightarrow NH_4Cl$
D $CH_3COOH + NH_3 \rightarrow CH_3COONH_4$

21 Which of the following substances consists of atoms?
Manakah antara bahan berikut terdiri daripada atom?

A Water
Air
B Oxygen
Oksigen
C Helium
Helium
D Naphthalene
Naftalena

22 Diagram 7 below shows the arrangement of electrons in atom G.
Rajah 7 di bawah menunjukkan susunan elektron dalam atom G.

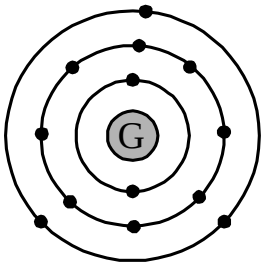


Diagram 7
Rajah 7

Which statements are correct?
Pernyataan manakah yang betul?

I It is placed in Period 3 in Periodic Table.
Ianya terletak dalam Kala 3 Jadual Berkala.
II It is placed in Group 13 in Periodic Table.
Ianya terletak dalam Kumpulan 13 Jadual Berkala.
III The ion of G is G^{3-}
Ion bagi G ialah G^{3-}
IV G formed an ionic compound with formula G_3O_2 when reacts with oxygen.
G membentuk sebatian ion dengan formula G_3O_2 apabila bertindak balas dengan oksigen.

A I and II only
I dan II sahaja
B II and IV only
II dan IV sahaja
C II and III only
II dan III sahaja
D I, II and IV only
I, II dan IV sahaja

23 Element L reacts with element M to form an ionic compound with the formula LM_2. The electron arrangement of an atom of M is 2.8.7. Which of the following is a possible electron arrangement of an atom of L?
Unsur L bertindak balas dengan unsur M untuk membentuk suatu sebatian ion yang mempunyai formula LM_2. Susunan elektron bagi atom M ialah 2.8.7. Antara yang berikut, yang manakah susunan elektron yang mungkin bagi atom L?
A 2.8.1
B 2.8.2
C 2.8.4
D 2.8.6

24 Which statement shows the difference between hexene and hexane?
Pernyataan manakah yang menunjukkan perbezaan antara heksena dan heksana?

A Hexene dissolves in water but hexane does not
Heksena larut dalam air tetapi heksana tidak larut dalam air

B The carbon percentage per molecule of hexene is higher
Peratus karbon per molekul bagi heksena lebih tinggi

C The number of hydrogen atoms per molecule of hexene is higher
Bilangan atom hidrogen per molekul heksena lebih tinggi

D Hexane decolourised the brown colour of bromine water but hexene does not
Heksana menyahwarnakan warna perang air bromin tetapi heksena tidak

25 The joint of a student's leg is swollen and painful. What medicine is suitable to be given to the student?
Sendi kaki seorang murid bengkak dan berasa sakit. Apakah ubat yang sesuai diberikan kepada murid itu?

A Insulin
Insulin

B Penicillin
Penisilin

C Barbiturate
Barbiturat

D Paracetamol
Parasetamol

26 Substance X is used to produce the product shown in Diagram 8.
Bahan X digunakan untuk menghasilkan produk yang ditunjukkan dalam Rajah 8.

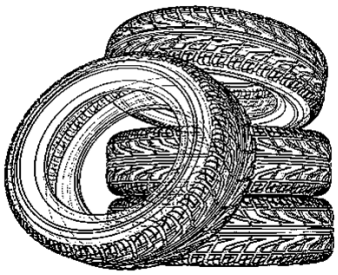


Diagram 8
Rajah 8

Which statement is true about substance X?
Pernyataan manakah yang benar tentang bahan X?

A Substance X less resistant to oxidation
Bahan X kurang tahan terhadap pengoksidaan

B Substance X has low melting point
Bahan X mempunyai takat lebur yang rendah

C Substance X is more elastic due to the present of carbon cross-links
Bahan X lebih kenyal kerana kehadiran rangkaian silang karbon

D Substance X is produced by soaking rubber in a solution of sulphur monochloride in methylbenzene
Bahan X dihasilkan dengan merendamkan getah di dalam larutan sulfur monoklorida dalam metilbenzena

27 The chemical equation below shows the reaction between iron (III) oxide and carbon.
Persamaan kimia di bawah menunjukkan tindak balas antara ferum (III) oksida dan karbon.

$$2Fe_2O_3 + 3C \rightarrow 4\,Fe + 3CO_2$$

The oxidation number of iron in the reaction changes from,
Nombor pengoksidaan untuk ferum berubah daripada,

A 0 to +3
0 kepada +3

B +3 to 0
+3 kepada 0

C +3 to -3
+3 kepada -3

D -3 to +3
-3 kepada +3

28 Diagram 9 shows cold pack used to reduce swelling.
Rajah 9 menunjukkan pek sejuk yang digunakan untuk mengurangkan bengkak.

Diagram 9
Rajah 9

Which statement explains the reaction occur in a cold pack?
Pernyataan manakah menerangkan tindak balas yang berlaku dalam pek sejuk?

A This reaction releases heat energy to the surroundings
Tindak balas ini membebaskan tenaga haba ke persekitaran

B ΔH for this reaction has negative value
ΔH bagi tindak balas ini mempunyai nilai negatif

C The total energy content of the reactants is lower than the products
Jumlah kandungan tenaga bahan tindak balas lebih rendah hasil tindak balas

D Example of reaction is when solid sodium hydroxide is dissolved in water
Contoh tindak balas ialah apabila pepejal natrium hidroksida dilarutkan dalam air

29 The following chemical equation represent the reaction between zinc, Zn and hydrochloric acid, HCl

Persamaan kimia berikut mewakili tindak balas antara zink, Zn dan asid hidroklorik, HCl

$$Zn_{(s)} + HCl_{(aq)} \rightarrow ZnCl_{2(aq)} + H_{2(g)}$$

$$Zn_{(p)} + HCl_{(ak)} \rightarrow ZnCl_{2(ak)} + H_{2(g)}$$

Which changes can be used to determine the rate of reaction?

Perubahan manakah boleh digunakan untuk menentukan kadar tindak balas?

I Mass of zinc per unit time
Jisim zink per unit masa

II Colour of the solution per unit time
Warna larutan per unit masa

III Volume of hydrogen released per unit time
Isipadu hidrogen yang dibebaskan per unit masa

IV Mass of zinc chloride produced per unit time
Jisim zink klorida yang terhasil per unit masa

A I and II
I dan II

B I and III
I dan III

C I and IV
I dan IV

D III and IV
III dan IV

30 Diagram 10 shows the electrolysis of silver nitrate solution using silver as electrodes.
Rajah 10 menunjukkan elektrolisis larutan argentum nitrat dengan menggunakan argentum sebagai elektrod.

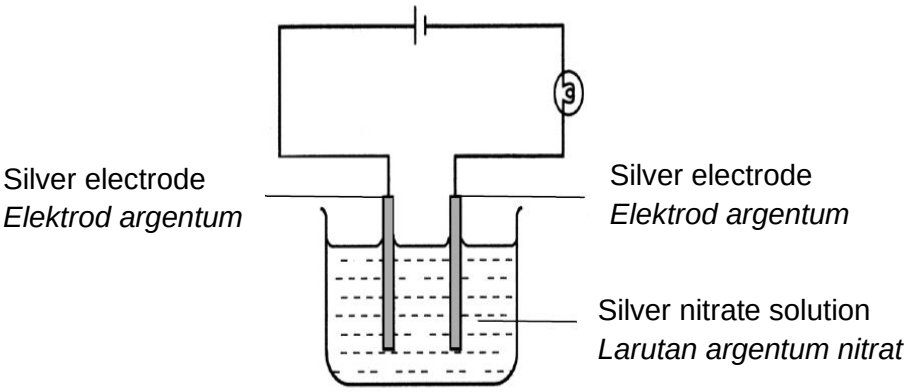


Diagram 10
Rajah 10

Which of the following half equations represents the reactions at the anode and cathode?
Manakah antara persamaan setengah yang berikut mewakili tindak balas di anod dan katod?

	Anode ***Anod***	**Cathode** ***Katod***
A	$Ag \rightarrow Ag^+ + e$	$2H^+ + 2e \rightarrow H_2$
B	$Ag \rightarrow Ag^+ + e$	$Ag^+ + e \rightarrow Ag$
C	$4OH^- \rightarrow 2H_2O + O_2 + 4e$	$Ag^+ + e \rightarrow Ag$
D	$4OH^- \rightarrow 2H_2O + O_2 + 4e$	$2H^+ + 2e \rightarrow H_2$

31 What is the oxidation number of Y in YO_4^{2-}?
Apakah nombor pengoksidaan bagi Y dalam YO_4^{2-}?

A + 2
B - 2
C + 6
D - 6

32 Shaun immersed a piece of filter paper into a beaker containing solution X, then he used solution Y to write “I LOVE CHEMISTRY” on the filter paper after the filter paper was dried. The wording on the filter paper is yellow in colour. Which of the following pairs is solution X and solution Y?
Shaun merendam sekeping kertas turas dalam larutan X, kemudian dia menggunakan larutan Y untuk menulis “I LOVE CHEMISTRY” di atas kertas turas tersebut setelah kertas turas kering. Tulisan pada kertas turas tersebut berwarna kuning. Antara berikut, yang manakah pasangan larutan X dan larutan Y?

A Sodium iodide and silver nitrate
Natrium iodida dan argentum nitrat

B Sodium iodide and lead (II) nitrate
Natrium iodida dan plumbum (II) nitrat

C Barium chloride and sodium nitrate
Barium klorida dan natrium nitrat

D Barium chloride and copper (II) nitrate
Barium klorida dan kuprum (II) nitrat

33 Diagram 11 shows an observation when a cockle shell is put into a beaker containing vinegar.
Rajah 11 menunjukkan satu pemerhatian apabila cangkerang kerang dimasukkan ke dalam bikar yang mengandungi cuka.

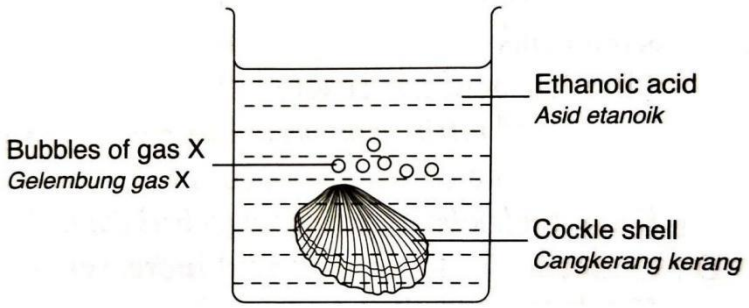


Diagram 11
Rajah 11

What is X?
Apakah X

A Oxygen
Oksigen

B Hydrogen
Hidrogen

C Sulphur dioxide
Sulfur dioksida

D Carbon dioxide
Karbon dioksida

34. Diagram 12 shows the electrons arrangements of atom X and atom Y.
X and Y are not the actual symbols of the elements. Element X react with element Y to form a compound.
Rajah 12 menunjukkan susunan elektron bagi atom X dan atom Y.
X dan Y bukan simbol sebenar bagi unsur tersebut. Unsur X bertindak balas dengan unsur Y membentuk satu sebatian.

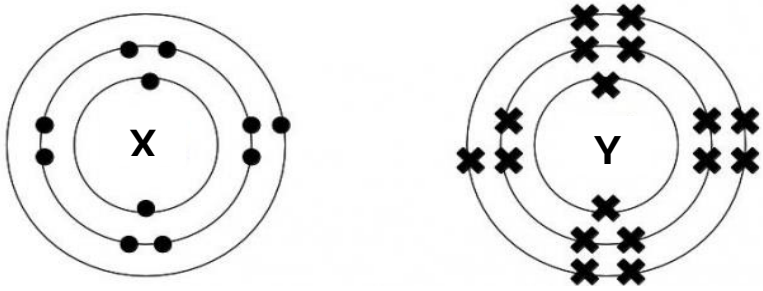


Diagram 12
Rajah 12

Which of the following is **true** about the reaction?
*Manakah antara berikut **benar** tentang tindak balas itu?*

I. Atom X donates 2 electrons
Atom X menderma 2 elektron
II. Atom Y receives 1 electron
Atom Y menerima 1 elektron
III. An ionic compound is formed
Satu sebatian ion terhasil
IV. The compound formed has chemical formula XY_2
Sebatian yang terbentuk mempunyai formula kimia XY_2

A I and II
I dan II
B II and III
II dan III
C III and IV
III dan IV
D I and IV
I dan IV

35. Caffeine, $C_8H_{10}N_4O_2$ is a natural stimulant found in coffee, tea and cocoa beans. What is the percentage of carbon atom by mass in this compound?
[Relative atomic mass : H = 1; C = 12; O = 16; N = 14]
Kafeina, $C_8H_{10}N_4O_2$ ialah perangsang semula jadi yang terdapat di dalam kopi, teh dan biji koko. Berapakah peratus atom karbon mengikut jisim yang terdapat dalam sebatian ini?
[Jisim atom relatif : H = 1; C = 12; O = 16; N = 14]

A 16.49%
B 5.15%
C 49.48%
D 28.87%

36 Diagram 13 below shows parts of the Periodic Table of Elements. W, X, Y and Z are not the actual symbols of the elements.
Which of the following shows the correct arrangement of elements W, X, Y and Z in order of increasing atomic size?
Rajah 13 di bawah menunjukkan sebahagian daripada Jadual Berkala Unsur. W, X, Y dan Z bukan simbol sebenar unsur-unsur tersebut.
Manakah antara yang berikut mewakili susunan yang betul dalam pertambahan saiz atom bagi unsur-unsur W, X, Y dan Z?

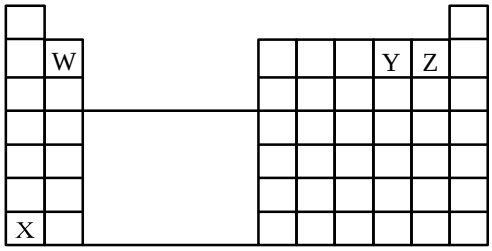


Diagram 13
Rajah 13

A W, X, Y, Z
B Z, Y, W, X
C Y, Z, X, W
D X, Y, W, Z

37 Diagram 14 shows a structural formula which represents a food additive to give a fruity flavour, particularly an apple.
Rajah 14 menunjukkan formula struktur yang mewakili satu bahan tambah makanan untuk memberikan rasa buah iaitu epal.

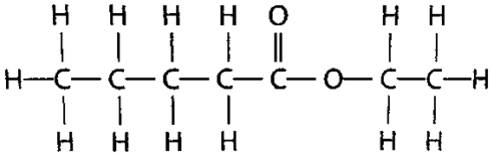


Diagram 14
Rajah 14

Which of the following can be used to make the flavouring?
Manakah antara yang berikut boleh digunakan untuk membuat perisa tersebut?

A Ethanol and pentanoic acid
Etanol dan asid pentanoik
B Pentanol and ethanoic acid
Pentanol dan asid etanoik
C Butanol and propanoic acid
Butanol dan asid propanoik
D Propanol and butanoic acid
Propanol dan asid butanoik

38 In an experiment, the reaction between excess marble and 50.0 cm^3 of 2 mol dm^{-3} hydrochloric acid produces carbon dioxide gas
Dalam satu eksperimen, tindak balas antara marmar berlebihan dengan 50.0 cm^3 asid hidroklorik 2 mol dm^{-3}menghasilkan gas karbon dioksida.

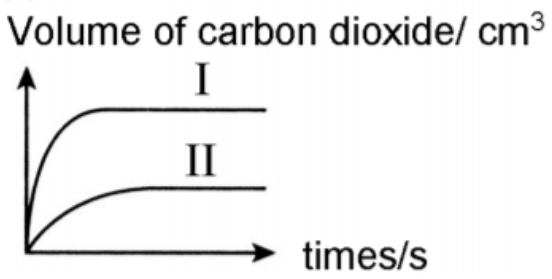


Diagram 15
R*ajah 15*

If the experiment is repeated using another solution, which solution will produce curve II in Diagram 15?
Sekiranya eksperimen diulang dengan menggunakan larutan lain, larutan manakah yang akan menghasilkan lengkung II dalam Rajah 15?

A 50.0 cm^3 of 1 mol dm^{-3} hydrochloric acid
50.0 cm^3 asid hidroklorik 1 mol dm^{-3}

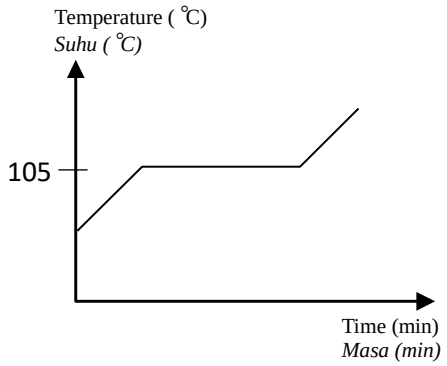
B 50.0 cm^3 of 1 mol dm^{-3} sulphuric acid
50.0 cm^3 asid sulfurik 1 mol dm^{-3}

C 25.0 cm^3 of 1 mol dm^{-3} hydrochloric acid
25.0 cm^3 asid hidroklorik 1 mol dm^{-3}

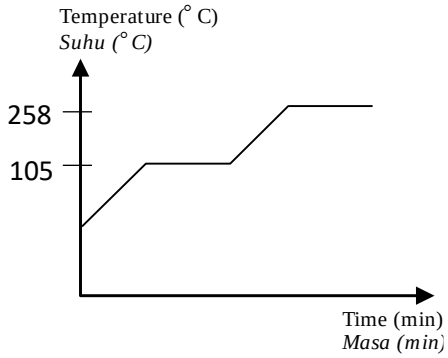
D 25.0 cm^3 of 2 mol dm^{-3} sulphuric acid
25.0 cm^3 asid sulfurik 2 mol dm^{-3}

39 A substance which melts at 105 °C and boils at 258 °C is heated from room temperature to 300 °C. Which of the following is the graph of temperature against time for the heating?
Satu bahan mencair pada 105 °C dan mendidih pada 258 °C dipanaskan daripada suhu bilik ke 300 °C. Manakah antara berikut merupakan graf suhu melawan masa untuk pemanasan?

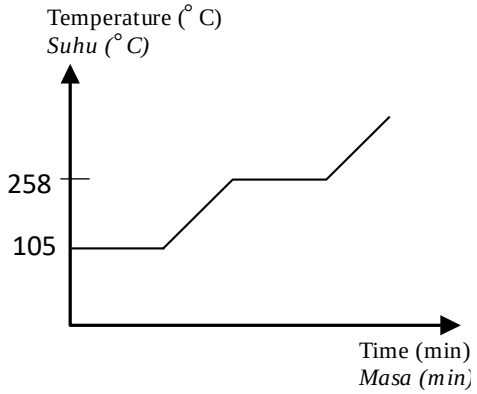
A



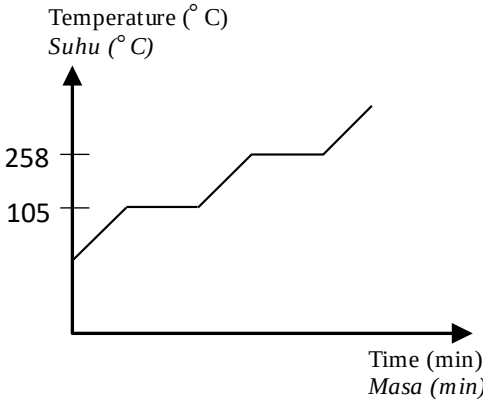
B



C



D



40 A decorative glassware maker encountered problem on his products which are fragile. He needs another material which is transparent but not fragile to replace glass. What is the most suitable material?
Seorang pembuat barang hiasan kaca menghadapi masalah bahan keluarannya mudah pecah. Dia memerlukan satu bahan lain yang bersifat lutsinar tetapi tidak mudah pecah untuk menggantikan kaca. Apakah bahan yang paling sesuai?

A Polyethene
Polietena

B Polypropene
Polipropena

C Polychloroethene
Polikloroetena

D Polymethylmethacrylate
Polimetilmetakrilat

41. The following chemical equation shows decomposition of hydrogen peroxide, H_2O_2.
Persamaan kimia berikut menunjukkan penguraian hidrogen peroksida, H_2O_2.

$$\mathbf{2H_2O_{2(l)} \rightarrow 2H_2O_{(l)} + O_{2(g)}}$$
$$\mathbf{2H_2O_{2(ce)} \rightarrow 2H_2O_{(ce)} + O_{2(g)}}$$

Calculate the volume of oxygen gas produced from decomposition of 30.3 g of hydrogen peroxide, H_2O_2 at room condition.
[Molar mass of H_2O_2 = 34 gmol $^{-1}$, Molar volume of gas = 24 dm^3mol^{-1} at room condition]
Hitungkan isipadu gas oksigen yang dihasilkan daripada penguraian 30.3 g hidrogen peroksida, H_2O_2 pada keadaan bilik.
[Jisim molar H_2O_2 = 34 gmol $^{-1}$, *Isipadu molar gas = 24 dm^3mol^{-1} keadaan bilik]*

A 10.7 dm^3

B 21.4 dm^3

C 42.7 dm^3

D 48.2 dm^3

42 Table 1 shows the results of an experiment for the three chemical cells P, Q and R.
Jadual 1 menunjukkan keputusan eksperimen bagi tiga sel kimia P, Q dan R.

Chemical cell ***Sel kimia***	**Pairs of metals** ***Pasangan logam***	**Voltage (V)** ***Voltan (V)***	**Negative terminal** ***Terminal negatif***
P	X – Y	0.50	X
Q	X – Z	0.65	Z
R	Y – Z	1.15	Z

Table 1
Jadual 1

Which of the following arrangements of metals X, Y and Z is descending order in the electrochemical series?
Manakah antara berikut merupakan susunan logam X, Y dan Z mengikut tertib menurun dalam siri elektrokimia?

A Z, X, Y
B Z, Y, X
C X, Y, Z
D X, Z, Y

43 Diagram 16 shows the set-up of apparatus used in an acid-base titration.
Rajah 16 menunjukkan susunan radas yang digunakan di dalam satu pentitratan asid-bes.

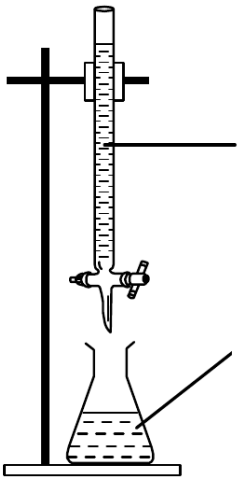


Diagram 16
Rajah 16

In the titration, the initial burette reading is 5.00 cm^3 and the final burette reading is 30.00 cm^3. Which of the following statements is **true**?
*Di dalam pentitratan tersebut, bacaan awal buret adalah 5.00 cm^3 dan bacaan akhir buret adalah 30.00 cm^3. Penyataan yang manakah adalah **betul**?*

I The colour changes from pink to colourless at the end point.
Warna berubah daripada merah jambu kepada tidak berwarna pada takat akhir.

II The volume of sulphuric acid used is 30.00 cm^3.
Isipadu asid sulfurik yang digunakan adalah 30.00 cm^3.

III The concentration of the sulphuric acid solution used to neutralise potassium hydroxide ialah 0.5 mol dm^{-3}.
Kepekatan larutan asid sulfurik yang digunakan untuk meneutralkan larutan kalium hidroksida adalah 0.5 mol dm^{-3}.

IV The products at the end point are potassium sulphate and water.
Hasil tindak balas pada takat akhir ialah kalium sulfat dan air.

A I and IV only
I dan IV sahaja

B II and III only
II dan III sahaja

C I and III only
I dan III sahaja

D III and IV
III dan IV

44 Table 2 shows the total volume of gas collected at regular intervals in a reaction.
Jadual 2 menunjukkan jumlah isipadu gas yang terkumpul pada sela masa tertentu dalam suatu tindak balas

Time (s) *Masa (s)*	0	60	120	180	240	300	360
Volume of carbon dioxide (cm^3) *Isipadu gas karbon dioksida (cm^3)*	0.00	24.00	36.00	44.00	48.00	50.00	50.00

Table 2
Jadual 2

What is the average rate of reaction in second minute?
Berapakah kadar tindak balas purata dalam minit kedua?

A $0.50\ cm^3\ s^{-1}$
B $0.40\ cm^3\ s^{-1}$
C $0.30\ cm^3\ s^{-1}$
D $0.20\ cm^3\ s^{-1}$

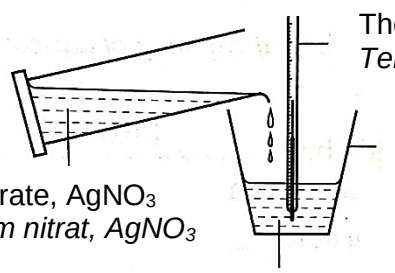
45 Diagram 17 shows a type of food that is used as flavouring.
Rajah 17 menunjukkan sejenis makanan yang digunakan sebagai perisa.

Diagram 17
Rajah 17

The preservative can be obtained when salt X is heated strongly. What is salt X?
Pengawet ini boleh diperoleh apabila garam X dipanaskan dengan kuat. Apakah garam X?

A Magnesium nitrate
Magnesium nitrat
B Ammonium nitrate
Ammonium nitrat
C Calcium nitrate
Kalsium nitrat
D Sodium nitrate
Natrium nitrate

46 Diagram 18 shows an experiment conducted to determine the heat of precipitation of silver chloride.
Rajah 18 menunjukkan satu eksperimen dijalankan untuk menentukan haba pemendakan bagi argentum klorida.



25 cm^3, 0.5 mol dm^{-3} silver nitrate, $AgNO_3$
25 cm^3, 0.5 mol dm^{-3} argentum nitrat, $AgNO_3$

25 cm^3, 0.5 mol dm^{-3} sodium chloride, NaCl
25 cm^3, 0.5 mol dm^{-3} natrium klorida, NaCl

Diagram 18
Rajah 18

The result obtained is shown in the following Table 3.
Keputusan yang diperoleh ditunjukkan dalam Jadual 3 di bawah.

Initial temperature of NaCl (°C) *Suhu awal NaCl (°C)*	28
Initial temperature of $AgNO_3$ (°C) *Suhu awal $AgNO_3$ (°C)*	28
Temperature of the mixture (°C) *Suhu campuran (°C)*	32

Table 3
Jadual 3

Calculate the heat of precipitation for this reaction.
[Specific heat capacity of water = 4.2 Jg^{-1} $°C^{-1}$, Density of water = 1.0 g cm^{-3}]
Hitung haba pemendakan bagi tindak balas ini.
[Muatan haba tentu air = 4.2 Jg^{-1} $°C^{-1}$, Ketumpatan air = 1.0 g cm^{-3}]

A -33.6 kJ mol^{-1}
B -67.2 kJ mol^{-1}
C -470.4 kJ mol^{-1}
D -537.6 kJ mol^{-1}

47 Diagram 19 shows apparatus set-up to investigate the electrolysis of glacial ethanoic acid. The bulb does not light up.
Rajah 19 menunjukkan susunan radas untuk mengkaji elektrolisis asid etanoik glasial. Mentol didapati tidak menyala.

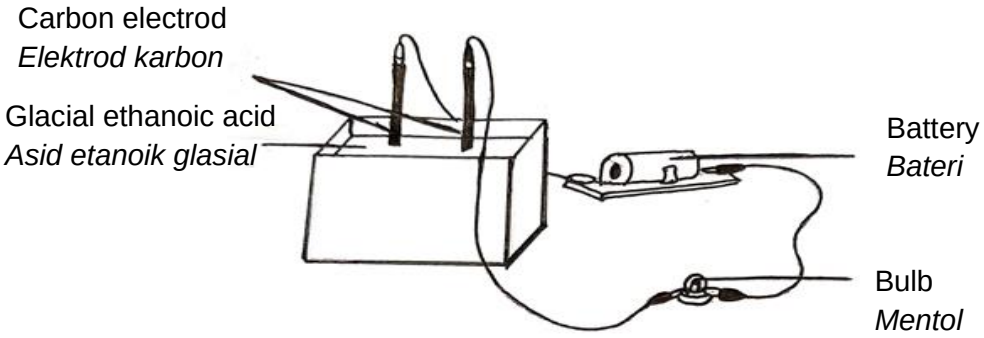


Diagram 19
Rajah 19

What can be done to overcome the problem?
Apakah yang boleh dilakukan untuk mengatasi masalah tersebut?

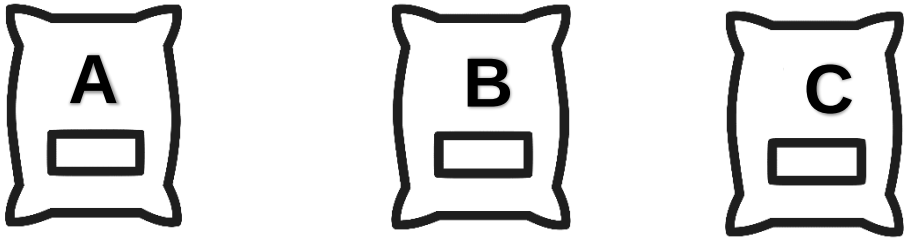
A Pour ethanol into glacial ethanoic acid
Tuangkan etanol ke dalam asid etanoik glasial

B Pour water into glacial ethanoic acid
Tuangkan air ke dalam asid etanoik glasial

C Replace carbon electrodes with copper electrodes
Gantikan elektrod karbon dengan elektrod kuprum

D Replace glacial ethanoic acid with silver chloride
Gantikan asid etanoik glasial dengan argentum klorida

48. Diagram 20 shows three different fertilizers A, B and C. A farmer had to choose the fertiliser with highest nitrogen contained for his plants.
Rajah 20 menunjukkan tiga baja yang berbeza, A, B dan C. Seorang petani perlu memilih baja yang mengandungi kandungan nitrogen yang paling tinggi bagi tanamannya.



Ammonium nitrate, NH_4NO_3	Urea, $CO(NH_2)_2$	Nitrosol, $Ca(NO_3)_2$
Ammonium nitrat, NH_4NO_3	*Urea,* $CO(NH_2)_2$	*Nitrosol,* $Ca(NO_3)_2$

Diagram 20
Rajah 20

What is the total percentage of nitrogen in the chosen fertilizer?
[Relative atomic mass: H = 1; N = 14; O = 16; C = 12; Ca = 40]
Berapakah jumlah peratus nitrogen dalam baja yang telah dipilih itu?
[Jisim atom relatif: H = 1; N = 14; O = 16; C = 12; Ca = 40]

A 35.11%
B 46.67%
C 17.07%
D 13.92%

49 The reaction between excess zinc and hydrochloric acid produces 20 cm^3 of hydrogen in 10 s. The reaction is completed in 1 minute and the maximum volume of hydrogen obtained is 40 cm^3. What is the average rate of reaction at 10 s?
Tindak balas antara zink berlebihan dan asid hidroklorik menghasilkan 20 cm^3 hidrogen dalam 10 s. Tindak balas adalah lengkap dalam 1 minit dan isipadu maksimum hidrogen yang diperoleh ialah 40 cm^3. Apakah kadar tindak balas purata pada 10 s?

A 4.0 $cm^3\ s^{-1}$
B 3.0 $cm^3\ s^{-1}$
C 2.0 $cm^3\ s^{-1}$
D 0.3 $cm^3\ s^{-1}$

50 Diagram 21 shows the apparatus set up to investigate the reaction of potassium iodide solution with iron(II) sulphate solution.
Rajah 21 menunjukkan susunan radas untuk mengkaji tindak balas antara larutan kalium iodida dan larutan ferum(II) sulfat.

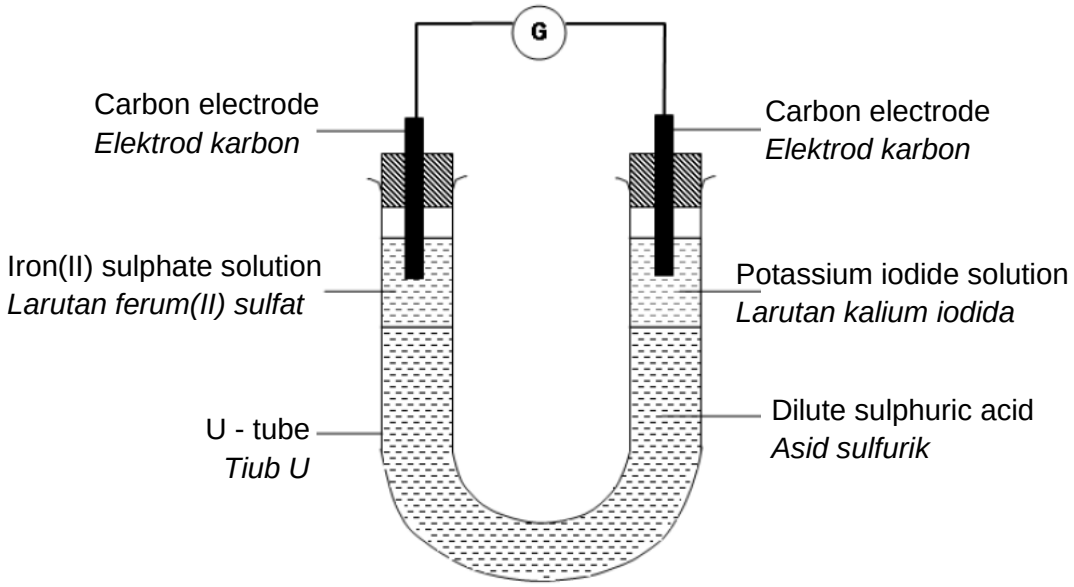


Diagram 21
Rajah 21

Which of the following reaction occurs in the solutions?
Tindak balas yang manakah berlaku dalam larutan tersebut?

A Iodide ion is oxidised to iodine molecule
Ion iodida dioksidakan kepada molekul iodin

B Iron(III) ion is oxidised to iron(II) ion
Ion ferum(III) dioksidakan kepada ion ferum(II)

C Potassium iodide is an oxidising agent
Kalium iodida adalah agen pengoksidaan

D The colour of potassium iodide change from green to yellow
Warna kalium iodida berubah dari hijau ke kuning

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT