

SULIT

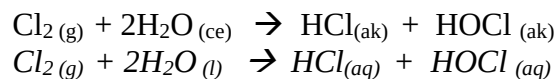
- 1 Amin menjalankan satu eksperimen untuk mengkaji keterlarutan garam sulfat dalam air. Apakah pemboleh ubah dimanipulasi dan dimalarkan dalam eksperimen Amin?

Amin carried out an experiment to study the solubility of sulphate salts. What are the manipulated and fixed variables for his experiment?

Pemboleh ubah dimanipulasi <i>Manipulated variable</i>	Pemboleh ubah dimalarkan <i>Fixed variable</i>
A Jenis garam sulfat <i>Type of sulphate salt</i>	Isipadu air <i>Volume of water</i>
B Isipadu air <i>Volume of water</i>	Jenis garam sulfat <i>Type of sulphate salt</i>
C Jenis garam sulfat <i>Type of sulphate salt</i>	Kadar kacauan <i>Rate of stirring</i>
D Kadar kacauan <i>Rate of stirring</i>	Jenis garam sulfat <i>Type of sulphate salt</i>

- 2 Satu eksperimen yang melibatkan tindak balas kimia yang diwakili oleh persamaan kimia di bawah telah dijalankan.

One experiment which involve the chemical reaction shown by the chemical equation below has been carried out.

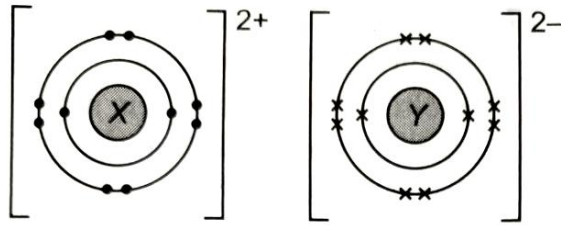


Apakah langkah berjaga-jaga yang mesti diambil semasa melakukan eksperimen ini?

What precaution must be taken when carrying out this experiment?

- | | |
|---|--|
| A Memakai sarung getah
<i>Wear rubber glove</i> | C Jauhkan dari penunu Bunsen
<i>Put away from Bunsen burners</i> |
| B Jalankan eksperimen dalam kebuk wasap
<i>Carry out experiment in a fume chamber</i> | D Pakai cermin mata keselamatan
<i>Wear goggles</i> |

- Diagram 1 shows the electron arrangement of an ionic compound.



Which is the electronic configuration of the X atom in the ionic compound above?

- Table 1 shows the melting point and boiling point of four substances.

Bahan <i>Substance</i>	Takat lebur (°C) <i>Melting point (°C)</i>	Takat didih(°C) <i>Boiling point (°C)</i>
W	-157	-9
X	-13	55
Y	80	196
Z	256	300

Which substance is a liquid at 100°C?

- A** **W** **B** **X** **C** **Y** **D** **Z**

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- 5 Ion magnesium dan atom magnesium mempunyai bilangan zarah subatom yang berbeza. Yang manakah **betul** tentang ion magnesium berbanding atom magnesium?

*Magnesium ion and magnesium atom have different number of atomic particles. Which of the following is **correct** about magnesium ion compared to magnesium atom?*

- A** Bilangan neutron yang lebih banyak
Higher number of neutrons
- B** Bilangan elektron yang lebih sedikit
Less number of electron
- C** Nombor proton yang lebih besar
Bigger proton number
- D** Nombor nukleon yang lebih kecil
Smaller nucleon number

- 6 Persamaan di bawah mewakili proses fotosintesis dalam tumbuhan.

The equation below represents photosynthesis process in plant.



Berapakah jisim glukosa yang terhasil apabila 24 dm^3 gas karbon dioksida digunakan?

[Jisim atom relatif: H= 1, C = 12, O= 16; 1 molar isipadu gas pada suhu bilik = 24 dm^3]

What is the mass of glucose produced if 24 dm^3 of carbon dioxide gas is used up?

[Relative atomic mass: H= 1, C = 12, O= 16; 1 molar gas volume at room temperature = 24 dm^3]

- A** 18 g **B** 20 g **C** 30 g **D** 40 g

- 7 Kira bilangan mol ion karbonat yang terdapat dalam 17.4 g ferum (II) karbonat.

[Jisim atom relatif: C= 12, O= 16, Fe= 56]

Calculate the number of mole for carbonate ion in 17.4 g of iron(II) carbonate?

[Relative atomic mass of C = 12, O = 16, Fe = 56]

- A** 0.15 mol **B** 0.72 mol **C** 0.30 mol **D** 0.45 mol

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- 8 Formula bagi ion nitrat ialah NO_3^- dan ion sulfat ialah SO_4^{2-} .

Jika formula garam nitrat bagi M ialah $\text{M}(\text{NO}_3)_3$, dan formula garam sulfat bagi M ialah $\text{M}_2(\text{SO}_4)_3$? Apakah formula untuk ion M?

The formulae for a nitrate ion is NO_3^- and for a sulphate is SO_4^{2-} . If the formula of the nitrate salt of M is $\text{M}(\text{NO}_3)_3$, and the formula of the sulphate salt of M is $\text{M}_2(\text{SO}_4)_3$. What is the formula of M ion?

- A M^+ B M^{2+} C M^{3+} D M^{4+}

- 9 Empat unsur K, L, M, dan N masing-masing bernombor proton 5, 11, 17, dan 19. Susunan menaik bagi sifat keelektropositifan keempat-empat unsur ini ialah...

Four elements K, L, M and N have the proton number of 5, 11, 17 and 19 respectively. The increasing order of electropositivity of the four elements is...

- A M,K,L,N B N,M,L,K C N,L,K,M D K,L,M,N

- 10 Unsur rubidium, terletak di dalam kumpulan yang sama dengan natrium dalam Jadual Berkala Unsur. Yang manakah **betul** tentang unsur rubidium?

Rubidium is an element placed in the same group as sodium in the Periodic Table of Elements. Which is true about rubidium?

- A Bertindak balas dengan klorin untuk menghasilkan gas yang tidak berwarna.
Reacts with chlorine to form a colourless gas.
- B Bertindak balas dengan oksigen untuk menghasilkan pepejal hitam.
Reacts with oxygen to produce a black solid.
- C Bertindak balas dengan air untuk menghasilkan larutan beralkali.
Reacts with water to produce an alkaline solution.
- D Bertindak balas dengan larutan natrium hidroksida untuk menghasilkan larutan berasid.
React with sodium hydroxide solution to produce an acidic solution.

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- 11 Pernyataan yang manakah **benar** tentang unsur ferum dan kuprum?

*Which statement is **true** about elements iron and copper?*

- | | |
|--|---|
| A Mempunyai satu nombor pengoksidaan
<i>Has one oxidation number</i> | C Membentuk ion kompleks
<i>Form complex ion</i> |
| B Membentuk ion tidak berwarna
<i>Form colourless ion</i> | D Mempunyai takat lebur yang rendah
<i>Have low melting point</i> |

- 12 Bahan Z mengalir arus elektrik dalam keadaan pepejal dan leburan. Bahan Z juga mempunyai takat lebur yang tinggi. Apakah bahan Z?

Substance Z conducts electricity in a solid or molten state. It also has high melting point.

What is substance Z?

- | | | | |
|----------------------------------|-------------|--------------------------|---------------|
| A Al_2O_3 | B Mg | C CaCl_2 | D NaOH |
|----------------------------------|-------------|--------------------------|---------------|

- 13 Pernyataan berikut ialah sifat-sifat sebatian P.

The following are the properties for compound P.

Mempunyai takat lebur dan takat didih yang tinggi <i>Has high melting and boiling point</i>	Tidak larut dalam pelarut organik <i>Does not soluble in organic solvent</i>
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Manakah berikut merupakan sebatian P?

Which of the following is compound P?

- | | | | |
|------------------------------------|-----------------------------------|---|-------------------------------|
| A Glukosa
<i>Glucose</i> | B Heksana
<i>Hexane</i> | C Naftalena
<i>Napthalene</i> | D Garam
<i>Salt</i> |
|------------------------------------|-----------------------------------|---|-------------------------------|

- 14 Susun bahan-bahan berikut mengikut urutan menaik takat didih.

Arrange the following substances in ascending order of their boiling point.

HF	H ₂ O	NH ₃
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A $\text{NH}_3 \rightarrow \text{HF} \rightarrow \text{H}_2\text{O}$

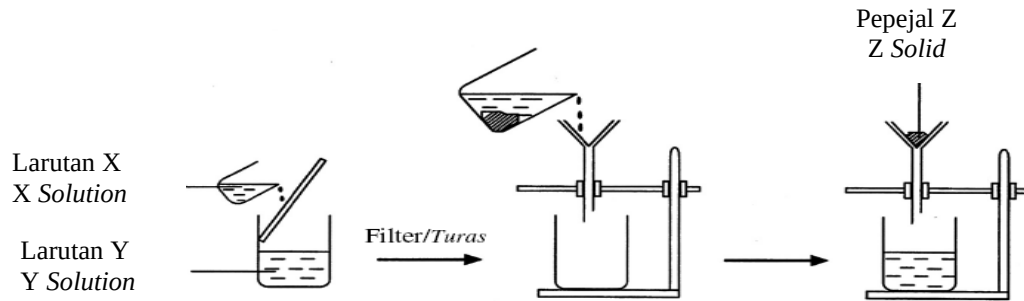
C $\text{HF} \rightarrow \text{NH}_3 \rightarrow \text{H}_2\text{O}$

B $\text{NH}_3 \rightarrow \text{H}_2\text{O} \rightarrow \text{HF}$

D $\text{HF} \rightarrow \text{H}_2\text{O} \rightarrow \text{NH}_3$

- 15 Rajah 2 menunjukkan susunan radas bagi satu eksperimen.

Diagram 2 shows the set-up of the apparatus of an experiment.



Rajah 2 / Diagram 2

Apakah bahan yang **tidak** boleh disediakan melalui kaedah dalam Rajah 2?

*What substance can **not** be prepared using the method in Diagram 2?*

A Natrium karbonat
Sodium carbonate

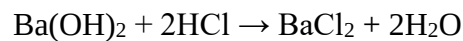
C Barium sulfat
Barium sulphate

B Kalsium sulfat
Calcium sulphate

D Argentum klorida
Silver chloride

- 16 Persamaan berikut mewakili tindak balas peneutralan antara barium hidroksida, $\text{Ba}(\text{OH})_2$ dengan asid hidroklorik, HCl .

The following equation represents the neutralisation reaction between barium hydroxide, $\text{Ba}(\text{OH})_2$ and hydrochloric acid, HCl .



Berapakah isi padu asid hidroklorik 0.5 mol dm^{-3} yang diperlukan untuk meneutralkan 50 cm^3 barium hidroksida 0.1 mol dm^{-3} ?

What is the volume of 0.5 mol dm^{-3} hydrochloric acid needed to neutralise 50 cm^3 of 0.1 mol dm^{-3} barium hydroxide?

A 5.0 cm^3

C 20.0 cm^3

B 10.0 cm^3

D 25.0 cm^3

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- 17 Abu mendapati beberapa jenis garam yang disediakan mengandungi bendasing. Antara garam yang berikut, yang manakah dapat dituliskan dengan kaedah penghabluran semula?

Abu found out a few types of salt prepared contain impurities. Which of the following salts can be purified by recrystallisation?

- | | |
|--|--|
| A Zink nitrat
<i>Zinc nitrate</i> | C Argentum klorida
<i>Silver chloride</i> |
| B Barium sulfat
<i>Barium sulphate</i> | D Plumbum(II) karbonat
<i>Lead(II) carbonate</i> |

- 18 Seorang murid ingin mengenalpasti kation yang hadir dalam suatu larutan garam. Apabila larutan ammonia ditambah ke dalam larutan garam itu, mendakan hijau terbentuk. Apakah kaedah yang perlu dilakukan seterusnya dan apakah pemerhatian yang dijangkakan untuk mengesahkan kehadiran kation itu?

A student wants to identify cation that present in a salt solution. When ammonia solution is added into the salt solution, green precipitate is formed. What is the method that need to be done next and the observation expected to confirm the presence of the cation?

	Kaedah <i>Method</i>	Pemerhatian <i>Observation</i>
A	Hangatkan larutan <i>Warm up the solution</i>	Kertas litmus merah bertukar biru <i>Red litmus paper turns to blue</i>
B	Panaskan larutan <i>Heat up the solution</i>	Air kapur menjadi keruh <i>Lime water turns chalky</i>
C	Tambahkan larutan kalium tiosianat <i>Add potassium thiocyanate solution</i>	Larutan merah darah dihasilkan <i>Red blood solution produced</i>
D	Tambah larutan kalium manganat(VII) berasid <i>Add acidic potassium manganate(VII)</i>	Larutan ungu dinyahwarna <i>Purple solution is decolourised</i>

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- 19** Jadual 2 menunjukkan jumlah isi padu gas oksigen, O₂ yang dikumpul dalam tindak balas penguraian hidrogen peroksida, H₂O₂.

Table 2 shows the total volume of oxygen gas, O₂ collected in the decomposition reaction of hydrogen peroxide, H₂O₂.

Time(s) <i>Masa (s)</i>	0	30	60	90	120	150	180	210	240
Volume of O₂(cm³) <i>Isi padu O₂ (cm³)</i>	0.00	18.00	27.50	35.00	41.50	46.50	50.00	50.00	50.00

Jadual 2 / Table 2

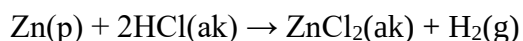
Berapakah kadar tindak balas purata untuk tindak balas tersebut?

What is the average rate of reaction for the reaction?

- A** 0.152 cm³ s⁻¹ **B** 0.208 cm³ s⁻¹ **C** 0.278 cm³ s⁻¹ **D** 0.346 cm³ s⁻¹

- 20** Dengan merujuk persamaan kimia di bawah, kaedah manakah yang paling sesuai untuk meningkatkan kadar tindak balas?

Based on the chemical equation below, which is the best method can be used to increase the rate of reaction?



- A** Menggunakan ketulan zink
Use zinc granule
- B** Mengurangkan isipadu asid hidroklorik
Decrease the volume of hydrochloric acid
- C** Gantikan asid hidroklorik dengan asid sulfurik
Replace hydrochloric acid with sulphuric acid
- D** Tambahkan air ke dalam asid hidroklorik
Add water to hydrochloric acid

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21 Dua eksperimen telah dijalankan seperti berikut:

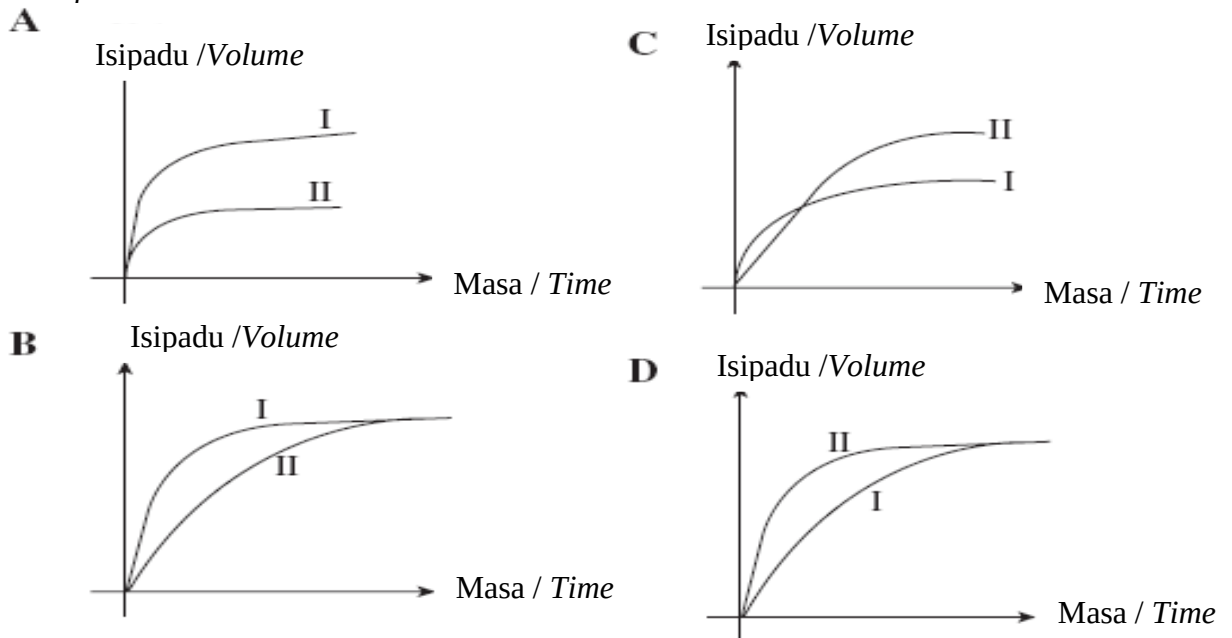
Two experiments are carried out as follows:

Eksperimen I : 5 g kalsium karbonat ditambah pada 50 cm³ 2.0 moldm⁻³ asid nitrik pada 40°C
Experiment I : 5 g of calcium carbonate is added to 50 cm³ of 2.0 moldm⁻³ nitric acid at 40 °C

Eksperimen II : 5 g kalsium karbonat ditambah pada 100 cm³ 1.0 moldm⁻³ asid nitrik pada 30°C
Experiment II : 5 g of calcium carbonate is added to 100 cm³ of 1.0 moldm⁻³ nitric acid at 30 °C

Antara graf-graf berikut yang manakah menunjukkan isipadu karbon dioksida yang dikumpul melawan masa bagi kedua-dua eksperimen tersebut?

Which of the following graphs shows the volume of carbon dioxide collected against time in both experiments?



22 Silikon dioksida adalah komposisi utama bagi kaca. Apakah jenis kaca yang terbentuk daripada silikon dioksida tanpa campuran bahan kimia yang lain?

Silicon dioxide is a major component of glass. What type of glass formed from silicon dioxide without the mixture of other chemical?

A Kaca soda kapur
Soda lime glass

B Kaca plumbum
Lead crystal glass

C Kaca borosilikat
Borosilicate glass

D Kaca silika terlakur
Fused glass

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- 23 Bahan komposit yang manakah mengandungi campuran kaca dan argentum klorida?

Which composite material contains a mixture of glass and silver chloride?

- A** Gentian kaca
Fibre glass
- B** Gentian optik
Fibre optic
- C** Kaca fotokromik
Photochromic glass
- D** Superkonduktor
Superconductor

- 24 Jadual 3 menunjukkan diameter lekuk selepas satu pemberat dijatuhkan ke atas permukaan dua bahan yang berbeza. Apakah Z?

Table 3 shows the diameter of dent after a weight is dropped on the surface of two different materials. What is Z?

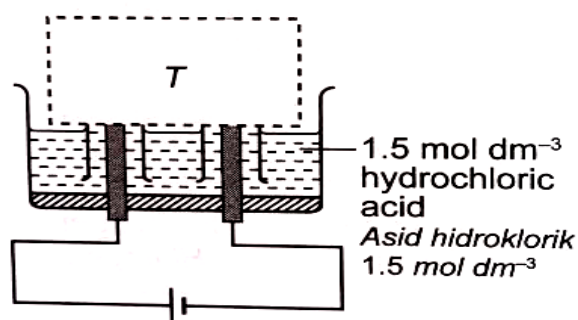
Bahan <i>Material</i>	Piuter <i>Pewter</i>	Z
Diameter lekuk (cm) <i>Diameter of dent (cm)</i>	0.1	0.5

Jadual 3 / Table 3

- A** Keluli
Steel
- B** Stanum
Tin
- C** Gangsa
Bronze
- D** Loyang
Brass

- 25 Rajah 3 menunjukkan susunan radas yang tidak lengkap bagi satu sel elektrolisis.

Diagram 3 shows an incomplete apparatus set-up of an electrolytic cell.

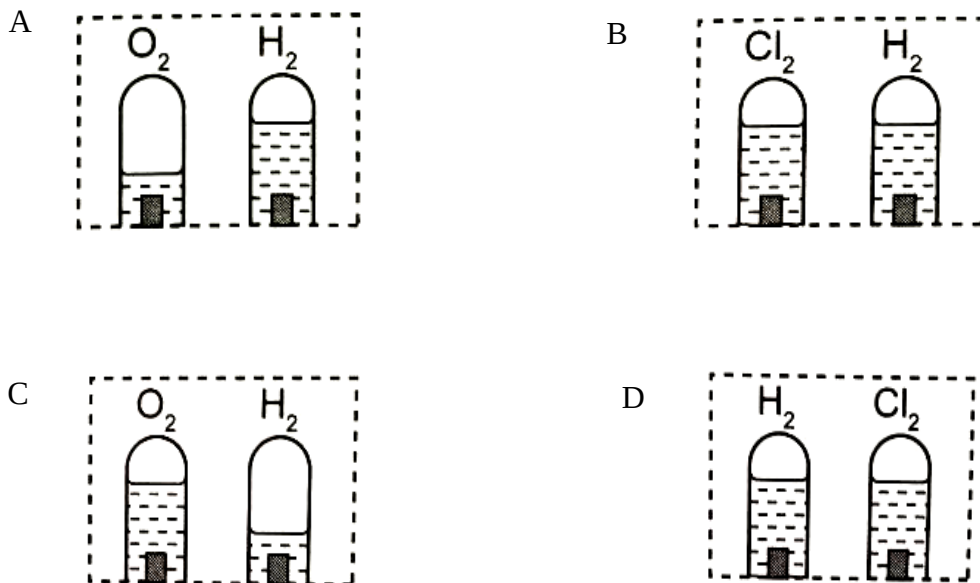


Rajah 3 / Diagram 3

Antara berikut, yang manakah menunjukkan pemerhatian yang betul pada T apabila larutan dielektrolisis selama 10 minit?

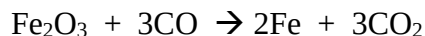
Which of the following shows the correct observation at T when the solution has been electrolysed for 10 minutes?

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- 26 Persamaan berikut menunjukkan tindak balas antara ferum(III) oksida, Fe_2O_3 dengan karbon monoksida, CO .

The following equation shows the reaction between iron(III) oxide, Fe_2O_3 with carbon monoxide, CO .



Antara berikut, yang manakah perubahan nombor pengoksidaan yang betul bagi ferum?

Which of the following is correct change for the oxidation number of iron?

- A** $+3 \rightarrow 0$ **B** $+2 \rightarrow +3$ **C** $+3 \rightarrow +2$ **D** $+2 \rightarrow 0$

- 27 Jadual 4 menunjukkan nilai keupayaan elektrod piawai setengah persamaan beberapa logam.

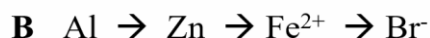
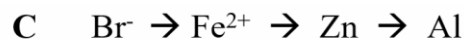
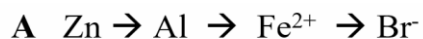
Table 4 shows the standard electrode potential values of the half equations of some metals.

Setengah Persamaan <i>Half equation</i>	E° (V)
$\text{Al}^{3+} + 3\text{e} \rightleftharpoons \text{Al}$	-1.66
$\text{Fe}^{3+} + \text{e} \rightleftharpoons \text{Fe}^{2+}$	+0.77
$\text{Zn}^{2+} + 2\text{e} \rightleftharpoons \text{Zn}$	-0.76
$\text{Br}_2 + 2\text{e} \rightleftharpoons 2\text{Br}^-$	+1.07

Jadual 4 / Table 4

Antara susunan berikut, yang manakah mengikut tertib menurun untuk agen penurunan?

Which of the following arrangement is in descending order of strength of reducing agent?



- 28** Formula struktur bagi satu sebatian organik ialah $\text{C}_2\text{H}_5\text{COOCH}_2\text{CH}_3$. Antara pasangan bahan berikut, yang manakah digunakan untuk menyediakan sebatian ini?

The structural formula of an organic compound is $\text{C}_2\text{H}_5\text{COOCH}_2\text{CH}_3$. Which pair of substances are used to prepare the compound?

A Asid propanik dan etanol
Propanoic acid and ethanol

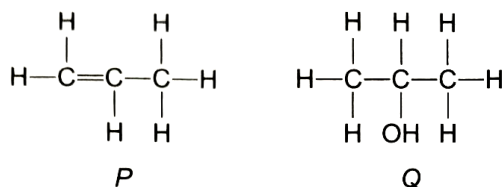
C Asid metanoik dan propanol
Methanoic acid and propanol

B Asid etanoik dan propanol
Ethanoic acid and propanol

D Asid propanoik dan metanol
Propanoic acid and methanol

- 29** Rajah 4 menunjukkam formula struktur bagi sebatian P dan sebatian Q.

Diagram 4 shows the structural formulae of compound P and compound Q.



Rajah 4 / Diagram 4

Yang manakah antara berikut boleh bertindak balas dengan P untuk menghasilkan Q?

Which of the following can react with P to produce Q?

A Air bromin
Bromine water

C Asid sulfuric pekat
Concentrated sulphuric acid

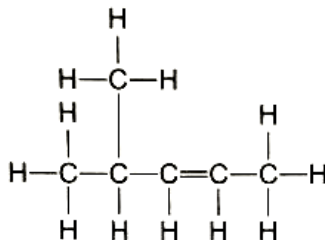
B Stim dan asid fosforik
Steam and phosphoric acid

D Larutan kalium manganate(VII) berasid
Acidified potassium manganate (VII) solution

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- 30** Rajah 5 menunjukkan formula struktur suatu hidrokarbon.

Diagram 5 shows the structural formula of a hydrocarbon.



Rajah 5 / Diagram 5

Nama IUPAC bagi formula struktur tersebut ialah...

The IUPAC name for the structural formula is...

- | | |
|--|---|
| A 2-metilbut-2-ena
2-methylbut-2-ene | C 4-metilbut-2-ena.
4-methylbut-2-ene |
| B 2-metilpent-2-ena
2-methylpent-2-ene | D 4-metilpent-2-ena.
4-methylpent-2-ene |
- 31** Persamaan kimia berikut menunjukkan pembakaran lengkap bagi gas butana.
The following chemical equation shows the complete combustion of butane gas.
- $$2\text{C}_4\text{H}_{10} + 13\text{O}_2 \rightarrow 8\text{CO}_2 + 10\text{H}_2\text{O}$$
- Berapakah isipadu butana yang diperlukan untuk menghasilkan 2.64 g karbon dioksida pada suhu bilik?
 [Jisim atom relatif: C = 12, O = 16; Isipadu molar gas pada suhu bilik = 24 dm³ mol⁻¹]
What is the volume of butane required to produce 2.64 g of carbon dioxide at room temperature?
- [Relative atomic mass: C = 12, O = 16; Molar volume of gas at room temperature = 24 dm³ mol⁻¹]

A 0.18 dm³

B 0.24 dm³

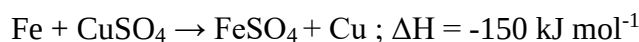
C 0.36 dm³

D 0.72 dm³

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- 32 Berikut ialah suatu persamaan termokimia.

The following is a thermochemical equation.



Berapakah perubahan haba apabila 0.32 g kuprum terbentuk dalam tindak balas ini?

[Jisim atom relatif: Cu = 64]

What is the heat change when 0.32 g of copper is formed in this reaction?

[Relative atomic mass: Cu = 64]

- A** 13.7 J **B** 75.0 J **C** 0.137 kJ **D** 0.750 kJ

- 33 Antara yang berikut, yang manakah tindak balas endotermik?

Which of the following is an endothermic reaction?

- A** $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
B $\text{HCl} + \text{NaHCO}_3 \rightarrow \text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$
C $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$
D $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$

- 34 100 cm³ air dipanaskan dengan pembakaran suatu sampel etanol. Haba dibebaskan daripada pembakaran itu ialah 1.05 kJ. Berapakah kenaikan maksimum suhu air itu?

[Muatan haba tentu air = 4.2 Jg⁻¹°C⁻¹]

100 cm³ of water is heated by the burning of sample of ethanol. The heat released by the combustion is 1.05 kJ. What is the maximum increase in temperature of the water?

[Specific heat capacity of water = 4.2 Jg⁻¹°C⁻¹]

- A** 0.025°C **B** 0.25°C **C** 2.5°C **D** 25°C

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- 35 Pek sejuk mengandungi bahan kimia yang bertindak balas untuk menyerap haba. Bahan manakah yang digunakan dalam pek sejuk?

Cold packs contain chemicals that react to absorb heat.

Which substance is used in cold packs?

- | | |
|--|--|
| A Kalsium klorida
<i>Calcium chloride</i> | C Magnesium sulfat
<i>Magnesium sulphate</i> |
| B Natrium karbonat
<i>Sodium carbonate</i> | D Ammonium nitrat
<i>Ammonium nitrate</i> |

- 36 Rajah 6 menunjukkan suatu alatan memasak yang disaluti teflon atau yang juga dikenali sebagai politetrafluoroetena, PTFE. Apakah monomer bagi teflon?

Diagram 6 shows a cookware which is coated with teflon or also known as polytetrafluoroethene, PTFE. What is the monomer of teflon?

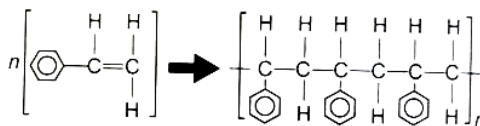


Rajah 6 / Diagram 6

- | | |
|---|---|
| A Etena
<i>Ethene</i> | C Fluoroetana
<i>Fluoroethane</i> |
| B Fluoroetena
<i>Fluoroethene</i> | D Tetrafluoroetena
<i>Tetrafluoroethene</i> |

- 37 Rajah 7 menunjukkan proses X. Apakah proses X?

Diagram 7 shows process X. What is process X?



Rajah 7 / Diagram 7

- | | |
|--|--|
| A Pengesteran
<i>Esterification</i> | C Pempolimeran penambahan
<i>Addition polymerisation</i> |
| B Pempolimeran kondensasi
<i>Condensation polymerisation</i> | D Pengoksidaan
<i>Oxidation</i> |

SULIT

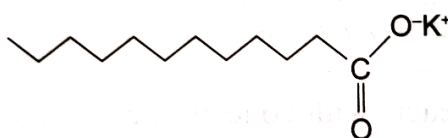
38 Antara berikut, yang manakah **bukan** sifat getah tervulkan?

*Which of the following is **not** the characteristic of vulcanised rubber?*

- | | |
|---|--|
| A Kekenyalan yang tinggi
<i>High elasticity</i> | C Ketahanan haba yang tinggi
<i>High resistance towards heat</i> |
| B Lembut dan berat
<i>Soft and heavy</i> | D Takat lebur yang tinggi
<i>High melting point</i> |

39 Rajah 8 menunjukkan formula struktur untuk sesuatu bahan.

Diagram 8 shows the structure formula of a substance.



Rajah 8 / Diagram 8

Apakah bahan itu?

What is the substance?

- | | |
|---|--------------------------------|
| A Asid karboksilik
<i>Carboxylic acid</i> | C Ester
<i>Ester</i> |
| B Detergen
<i>Detergent</i> | D Sabun
<i>Soap</i> |

40 Antara yang berikut, yang manakah kandungan asas kosmetik?

Which of the following are the basic contents of cosmetics?

- | | |
|--|--|
| I Pengantioksida
<i>Antioxidants</i> | III Pengemulsi
<i>Emulsifiers</i> |
| II Pewarna
<i>Dyes</i> | IV Air
<i>Water</i> |
| A I, II dan III
<i>I, II and III</i> | C I, II dan IV
<i>I, II and IV</i> |
| B II, III and IV
<i>II, III and IV</i> | D I, II, III dan IV
<i>I, II, III and IV</i> |

***** SOALAN TAMAT *****

END OF QUESTION

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[lihat muka surat sebelah
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