

NAMA ..

TINGKATAN

MODUL PINTAS 2024

TINGKATAN 5

4541/1

KIMIA

Kertas 1

1 jam 15 minit

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Kertas peperiksaan ini mengandungi **40** soalan.
2. Jawab **semua** soalan.
3. Bagi setiap soalan, pilih **satu** jawapan sahaja. **Hitamkan** jawapan anda pada kertas jawapan objektif yang disediakan.
4. Kertas peperiksaan ini adalah dalam dwibahasa.
5. **Kertas jawapan objektif** hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

Kertas peperiksaan ini mengandungi 24 halaman bercetak.

- 1 Rajah 1 menunjukkan peralatan keselamatan di dalam makmal.

Diagram 1 shows the safety equipment in the laboratory.



Rajah 1
Diagram 1

Antara bahan kimia berikut, yang manakah perlu dikendalikan di dalam peralatan keselamatan yang ditunjukkan dalam Rajah 1?

Which of the following chemicals need to be handled inside the safety equipment shown in Diagram 1?

- A Gas klorin
Chlorine gas
- B Asid nitrik
Nitric acid
- C Gas oksigen
Oxygen gas
- D Kalium manganat(VII) berasid
Acidified potassium manganate(VII)

- 2 Apakah formula kimia bagi aluminium karbonat?

What is the chemical formula of aluminium carbonate?

- A AlCO_3
- B $\text{Al}(\text{CO}_3)_3$
- C $\text{Al}_2(\text{CO}_3)_3$
- D $\text{Al}_3(\text{CO}_3)_2$

- 3 Antara berikut, bahan yang manakah terdiri daripada ikatan ion?

Which of the following substances consist of ionic bond?

- | | |
|--|--|
| A Sulfur dioksida
<i>Sulphur dioxide</i> | B Tetraklorometana
<i>Tetrachloromethane</i> |
| C Karbon monoksida
<i>Carbon monoxide</i> | D Magnesium klorida
<i>Magnesium chloride</i> |

- 4 Antara yang berikut, faktor manakah mempengaruhi kadar tindak balas?

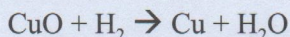
Which of the following factors affect the rate of reaction?

- I Kehadiran mangkin
Presence of catalyst
- II Jisim bahan tindak balas
Mass of reactants
- III Bilangan mol
Number of mole
- IV Saiz bahan tindak balas
Size of reactants

- | | |
|-----------------------------------|-----------------------------------|
| A I dan II
<i>I and II</i> | B I dan IV
<i>I and IV</i> |
| C II dan III
<i>II and III</i> | D III dan IV
<i>III and IV</i> |

- 5 Persamaan berikut menunjukkan tindak balas antara kuprum(II) oksida dan gas hidrogen.

The following equation shows the reaction between copper(II) oxide and hydrogen gas.



Apakah jenis tindak balas yang berlaku pada kuprum(II) oksida?

What is the type of reaction that takes place for copper(II) oxide?

- | | |
|--------------------------------------|--|
| A Penurunan
<i>Reduction</i> | B Pengoksidaan
<i>Oxidation</i> |
| C Pemendakan
<i>Precipitation</i> | D Peneutralan
<i>Neutralisation</i> |

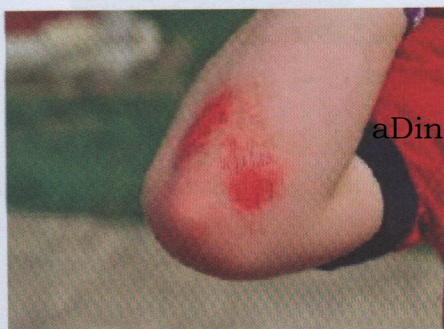
- 6 Antara berikut, tindak balas yang manakah menyerap haba daripada persekitaran?

Which of the following reactions absorbs heat from the surrounding?

- A $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
 B $\text{KOH} + \text{HCl} \rightarrow \text{KCl} + \text{H}_2\text{O}$
 C $\text{C}_2\text{H}_4 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$
 D $\text{Mg} + 2\text{HNO}_3 \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{H}_2$

- 7 Rajah 2 menunjukkan kecederaan yang dialami oleh seorang murid semasa hari sukan.

Diagram 2 shows an injury of a student during sports day.



Rajah 2
Diagram 2

Apakah jenis ubat yang perlu diambil oleh murid ini?

What type of medicine should be taken by the student?

- | | |
|--|---|
| A Analgesik
<i>Analgesics</i> | B Antimikrob
<i>Antimicrobials</i> |
| C Kortikosteroid
<i>Corticosteroids</i> | D Ubat psikotik
<i>Psychotic drugs</i> |

- 8 Antara bahan berikut, yang manakah terdiri daripada molekul?

Which of the following substances consist of molecules?

- | | |
|---------------------------------------|---|
| A Zink
<i>Zinc</i> | B Zink nitrat
<i>Zinc nitrate</i> |
| C Gas nitrogen
<i>Nitrogen gas</i> | D Natrium klorida
<i>Sodium chloride</i> |

9



Diagram 3

Antara yang berikut, yang manakah benar tentang unsur-unsur itu?

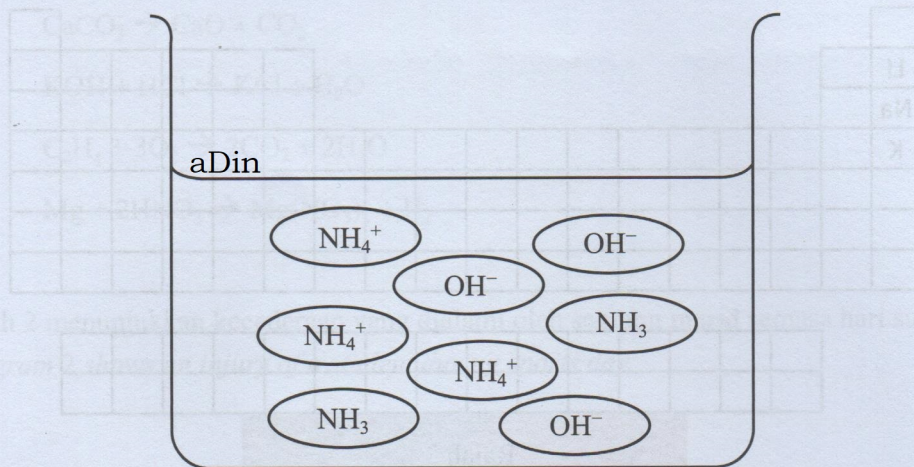
Which of the following is true about the elements?

- A** Tidak berwarna
Colourless
- B** Wujud dalam keadaan gas pada suhu bilik
Exist as gas at room temperature
- C** Mempunyai lebih daripada satu nombor pengoksidaan
Has more than one oxidation number
- D** Boleh bertindak balas dengan air untuk menghasilkan gas hidrogen
Can react with water to produce hydrogen gas

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Rajah 4 menunjukkan jenis zarah-zarah yang terdapat dalam suatu larutan.

Diagram 4 shows types of particles in a solution.



Rajah 4
Diagram 4

Antara yang berikut, manakah mewakili larutan yang ditunjukkan?

Which of the following represents the type of solution shown?

- A Asid kuat
Strong acid
- B Asid lemah
Weak acid
- C Alkali kuat
Strong alkali
- D Alkali lemah
Weak alkali

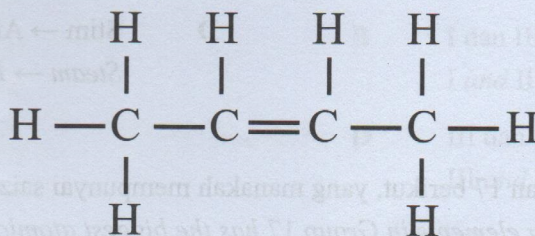
11 Apakah yang dimaksudkan dengan aloi?

What is meant by alloy?

- A Unsur yang terbentuk daripada dua atau lebih jenis atom mengikut komposisi yang tertentu
Elements formed from two or more types of atoms according to a certain composition
- B Campuran dua atau lebih unsur dengan komposisi yang tertentu yang mana unsur utamanya ialah logam
A mixture of two or more elements with a specific composition where the main element is a metal
- C Campuran logam dan bukan logam yang berpadu secara kimia yang mana komponen utamanya ialah logam
A chemically combined mixture of metals and non-metals where the main component is a metal
- D Sebatian dengan dua atau lebih unsur dalam komposisi yang tertentu yang mana komponen utamanya ialah logam
A compound with two or more elements in a specific composition where the main component is a metal

12 Rajah 5 menunjukkan suatu sebatian kimia.

Diagram 5 shows a chemical compound.



Rajah 5
 Diagram 5

Berapakah bilangan isomer bagi sebatian dalam Rajah 5?

What is the number of isomers for compound in Diagram 5?

- A 2
- B 3
- C 4
- D 5

- 13 Antara pernyataan berikut, yang manakah benar untuk menerangkan penggumpalan lateks?
Which of the following statements is true to explain the coagulation of latex?

- A Ion hidrogen daripada asid meneutralkan cas negatif pada membran protein.
Hydrogen ions from the acid neutralise the negatively charged on the protein membrane.
- B Ion hidroksida daripada larutan ammonia meneutralkan ion hidrogen daripada asid laktik.
Hydroxide ions from the ammonia solution neutralise the hydrogen ions from lactic acid.
- C Penolakan antara zarah bercas positif menghalang zarah-zarah getah daripada mendekati satu sama lain.
Repulsion between the positively charged particles prevents the rubber particles from coming closer to one another.

- 14 Antara yang berikut, perubahan keadaan jirim manakah yang menyebabkan tenaga kinetik zarah-zarah bertambah?

Which of the following inter-conversions of matter causes the kinetic energy of particles to increase?

A Air → Stim
Water → Steam

B Stim → Air
Steam → Water

C Air → Ais
Water → Ice

D Stim → Ais
Steam → Ice

- 15 Antara unsur Kumpulan 17 berikut, yang manakah mempunyai saiz atom paling besar?
Which of the following elements in Group 17 has the biggest atomic size?

A Iodin
Iodine

B Fluorin
Fluorine

C Klorin
Chlorine

D Bromin
Bromine

16 Antara berikut, yang manakah ialah asid diprotik?

Which of the following is a diprotic acid?

A Asid nitrik

Nitric acid

B Asid etanoik

Ethanoic acid

C Asid sulfurik

Sulphuric acid

D Asid hidroklorik

Hydrochloric acid

17 Antara berikut, yang manakah benar tentang aloi dan komponen utama di dalamnya?

Which of the following is true about alloys and their main components?

	Aloi <i>Alloy</i>	Komponen utama <i>Main component</i>
I	Loyang <i>Brass</i>	Kuprum <i>Copper</i>
II	Keluli <i>Steel</i>	Stanum <i>Tin</i>
III	Duralumin <i>Duralumin</i>	Aluminium <i>Aluminium</i>
IV	Gangsa <i>Bronze</i>	Zink <i>Zinc</i>

A I dan II

I and II

B I dan III

I and III

C II dan IV

II and IV

D III dan IV

III and IV

18 Antara yang berikut, manakah merupakan polimer sintetik?

Which of the following is a synthetic polymer?

A Glukosa

Glucose

B Polietena

Polythene

C Poliisoprena

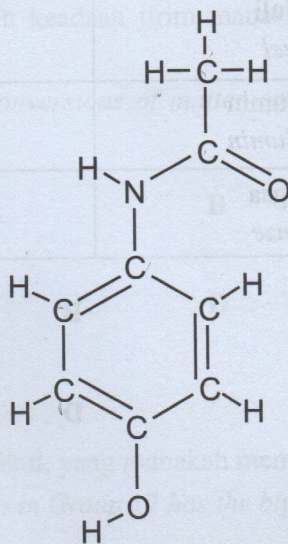
Polyisoprene

D Asid deoksiribonukleik

Deoxyribonucleic acid

- 19 Antara yang berikut, manakah benar tentang sebatian karbon?
Which of the following is true about carbon compound?
- A Semua sebatian karbon ialah sebatian organik
All carbon compounds are organic compounds
- B Semua sebatian karbon hanya membentuk ikatan kovalen
All carbon compounds only form covalent bond
- C Semua sebatian karbon mempunyai sekurang-kurangnya satu atom karbon dalam strukturnya
All carbon compounds contain at least one carbon atom in their structure

- 20 Rajah 6 menunjukkan formula struktur bagi suatu bahan yang terdapat dalam ubat yang berfungsi melegakan rasa sakit.
Diagram 6 shows the structural formula for a substance found in a medicine that works to relieve pain.



Rajah 6
Diagram 6

Apakah formula molekul bagi bahan ini?
What is the molecular formula for this substance?

- A $C_8H_9O_2$
- B $C_9H_8O_2$
- C $C_8H_9NO_2$
- D $C_9H_8NO_2$

21 Rajah 7 menunjukkan pembentukan ikatan antara dua jenis zarah.

Diagram 7 shows the bond formation of two types of particles.



Rajah 7
Diagram 7

Apakah jenis ikatan kimia yang terbentuk?

What is the type of chemical bond formed?

- A Ikatan ion
Ionic bond
- B Ikatan datif
Dative bond
- C Ikatan logam
Metallic bond
- D Ikatan hidrogen
Hydrogen bond

22 Antara proses yang berikut, manakah merupakan tindak balas yang perlahan?

Which of the following processes is a slow reaction?

A Pemendakan
Precipitation

B Pembakaran
Combustion

C Fotosintesis
Photosynthesis

D Peneutralan
Neutralisation

23 Antara yang berikut, persamaan manakah mewakili satu tindak balas redoks?

Which of the following equations represent a redox reaction?

A $2\text{CuO} + \text{C} \rightarrow 2\text{Cu} + \text{CO}_2$

B $\text{H}_2\text{SO}_4 + \text{CuO} \rightarrow \text{CuSO}_4 + \text{H}_2\text{O}$

C $\text{Pb}(\text{NO}_3)_2 + 2\text{KI} \rightarrow \text{PbI}_2 + 2\text{KNO}_3$

D $2\text{CH}_3\text{COOH} + \text{CaCO}_3 \rightarrow (\text{CH}_3\text{COO})_2\text{Ca} + \text{H}_2\text{O} + \text{CO}_2$

24 Takat didih kalium lebih rendah daripada natrium. Pernyataan manakah yang paling tepat menerangkan fenomena ini?

The boiling point of potassium is lower than sodium. Which statement most accurately explains this phenomenon?

A Saiz atom natrium lebih kecil
The atomic size of sodium is smaller

B Kalium lebih reaktif berbanding natrium
Potassium is more reactive than sodium

C Daya tarikan antara atom kalium lebih lemah
The force of attraction between the potassium atoms are weaker

D Ikatan kovalen antara atom kalium lebih lemah
Covalent bond between the potassium atoms are weaker

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25 Antara pasangan berikut, yang manakah dipadankan dengan betul?

Which of the following pairs is matched correctly?

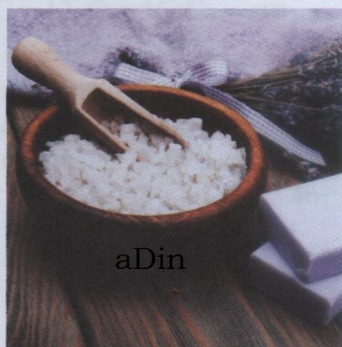
	Bidang Field	Bahan kimia Chemicals
A	Makanan Food	Herbisid Herbicide
B	Pertanian Agriculture	Penstabil Stabiliser
C	Perubatan Medicine	Analgesik Analgesic
D	Perindustrian Industry	Pengawet Preservative

26 Rajah 8 menunjukkan garam epsom yang sering digunakan dalam larutan rendaman kaki untuk melegakan lenguh kaki. Ia terdiri daripada serbuk putih magnesium sulfat heptahidrat, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$. Berapakah jisim molar magnesium sulfat heptahidrat?

[Jisim atom relatif: $\text{Mg} = 24$; $\text{S} = 32$; $\text{O} = 16$; $\text{H} = 1$]

Diagram 8 shows epsom salt which is often used in foot soak solution to relief foot ache. It consists of white powder magnesium sulphate heptahydrate, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$. What is the molar mass of magnesium sulphate heptahydrate?

[Relative atomic mass: $\text{Mg} = 24$; $\text{S} = 32$; $\text{O} = 16$; $\text{H} = 1$]

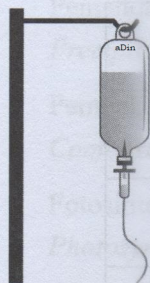


• Rajah 8
Diagram 8

- A 120
- B 126
- C 246
- D 290

27 Kaji maklumat berikut.

Study the following information.



Rajah 9 menunjukkan larutan salin yang mengandungi larutan natrium klorida dengan kepekatan 9 g dm^{-3} . Ia biasanya digunakan dalam hospital untuk membekalkan keperluan harian air dan garam kepada pesakit yang tidak berupaya untuk makan dan minum secara oral.

Diagram 9 shows saline solution that contains sodium chloride solution with a concentration of 9 g dm^{-3} . It is commonly used in hospitals to supply daily water and salt needs to patients who are unable to consume orally.

Rajah 9
Diagram 9

Apakah kemolaran larutan salin tersebut?

[Jisim atom relatif: Na = 23, Cl = 35.5]

What is the molarity of the saline solution?

[Relative atomic mass: Na = 23, Cl = 35.5]

- A 0.01 mol dm^{-3}
- B 0.06 mol dm^{-3}
- C 0.15 mol dm^{-3}
- D 0.53 mol dm^{-3}

- 28 Rajah 10 menunjukkan keadaan sebuah lori yang membawa asid sulfurik pekat yang telah terbalik di atas jalan raya.

Diagram 10 shows the condition of a lorry carrying concentrated sulphuric acid that has overturned on the road.



Rajah 10
Diagram 10

1200 cm³ asid sulfurik 4.65 mol dm⁻³ telah tertumpah di jalan raya.

Sebatian kalsium karbonat digunakan untuk bertindak balas dengan asid bagi menghasilkan kalsium sulfat, karbon dioksida dan air supaya tidak membahayakan pengguna jalan raya yang lain.

Berapakah jisim minimum sebatian kalsium karbonat yang diperlukan?

[Jisim atom relatif: H = 1, C = 12, O = 16, Ca = 40]

1200 cm³ of 4.65 mol dm⁻³ sulphuric acid has spilled on the road.

Calcium carbonate compound is used to react with the acid to produce calcium sulphate, carbon dioxide and water so as not to endanger other road users.

What is the minimum mass of calcium carbonate compound required?

[Relative atomic mass: H = 1, C = 12, O = 16, Ca = 40]

- | | |
|---|--------|
| A | 100 g |
| B | 1200 g |
| C | 558 g |
| D | 5580 g |

29 Kaji senario berikut.

Study the following scenario.

Pak Ahmad bekerja di sebuah ladang ubi kentang. Dia mendapati tanaman ubi kentang tidak bertumbuh dengan baik. Setelah diarah oleh majikannya, dia menabur kapur tohor (kalsium oksida) pada tanah ladang selama seminggu. Selepas beberapa minggu, tanaman ubi kentang menjadi lebih sihat.

Pak Ahmad works at a potato plantation. He noticed that the potato crops were not growing very well. Instructed by his employers, he sprinkled some quicklime (calcium oxide) onto the soil for a week. After few weeks, the potato crops become healthier.

Apakah tujuan menabur kapur tohor pada tanah ladang?

What was the purpose of sprinkling the quicklime onto the soil?

- A Untuk meneutralkan tanah yang berasid
To neutralise the acidity of the soil
- B Untuk membunuh anai-anai dalam tanah
To kill the termites in the soil
- C Untuk membunuh mikroorganisma dalam tanah
To kill microorganisms in the soil
- D Untuk membekalkan nutrien kepada akar tanaman ubi kentang
To provide nutrients to the roots of the potato crops

30 Jadual 1 menunjukkan jumlah isi padu gas hidrogen yang terkumpul dalam satu eksperimen.

Table 1 shows the volume of hydrogen gas collected in an experiment.

Masa (s) <i>Time (s)</i>	0	30	60	90	120	150	180	210
Isi padu gas (cm ³) <i>Volume of gas (cm³)</i>	0.00	5.20	8.70	11.90	14.70	16.20	17.00	17.00

Jadual 1

Table 1

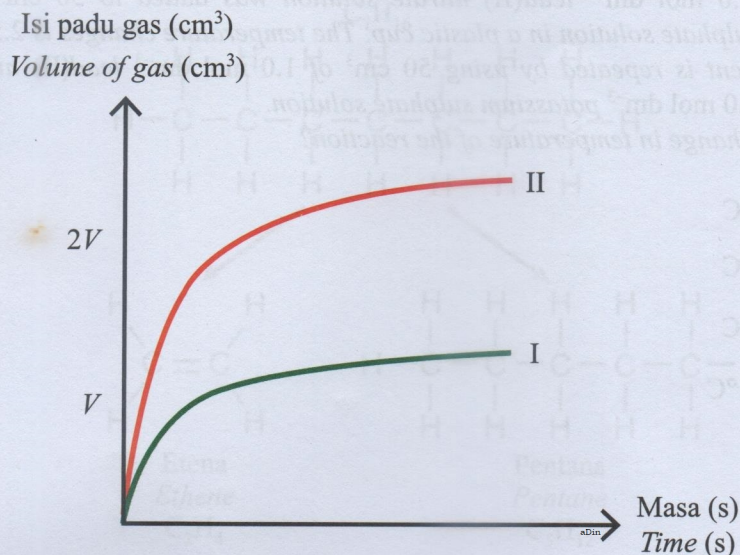
Hitungkan kadar tindak balas purata keseluruhan tindak balas ini.

Calculate the average rate of reaction for overall reaction.

- A $0.081 \text{ cm}^3 \text{ s}^{-1}$
- B $0.094 \text{ cm}^3 \text{ s}^{-1}$
- C $0.100 \text{ cm}^3 \text{ s}^{-1}$
- D $0.145 \text{ cm}^3 \text{ s}^{-1}$

- 31 Rajah 11 menunjukkan graf isi padu gas karbon dioksida melawan masa bagi tindak balas antara 5 g serbuk kalsium karbonat, CaCO_3 dan 50 cm^3 asid hidroklorik, HCl 1.0 mol dm^{-3} .

Diagram 11 shows a graph of volume of carbon dioxide gas against time for the reaction between 5 g calcium carbonate powder, CaCO_3 and 50 cm^3 of 1.0 mol dm^{-3} hydrochloric acid, HCl .



Rajah 11
Diagram 11

Antara tindak balas berikut, yang manakah akan menghasilkan lengkung II?

Which of the following reaction will produce curve II?

- A Menambahkan beberapa titis larutan kuprum(II) sulfat
Add a few drops of copper(II) sulphate solution
- B 5 g serbuk kalsium karbonat, CaCO_3 + 50 cm^3 asid hidroklorik, HCl 2.0 mol dm^{-3}
5 g calcium carbonate powder, CaCO_3 + 50 cm^3 of 2.0 mol dm^{-3} hydrochloric acid, HCl
- C 5 g serbuk kalsium karbonat, CaCO_3 + 100 cm^3 asid hidroklorik, HCl 1.0 mol dm^{-3}
5 g calcium carbonate powder, CaCO_3 + 100 cm^3 of 1.0 mol dm^{-3} hydrochloric acid, HCl
- D 5 g ketulan kalsium karbonat, CaCO_3 + 50 cm^3 asid hidroklorik, HCl 1.0 mol dm^{-3}
5 g calcium carbonate chips, CaCO_3 + 50 cm^3 of 1.0 mol dm^{-3} hydrochloric acid, HCl

- 32 50 cm³ larutan plumbum(II) nitrat 1.0 mol dm⁻³ ditambahkan kepada 50 cm³ larutan kalium sulfat 1.0 mol dm⁻³ di dalam sebuah cawan plastik. Perubahan suhu ialah 2.5 °C. Eksperimen diulang dengan menggunakan 50 cm³ larutan plumbum(II) nitrat 1.0 mol dm⁻³ dan 100 cm³ larutan kalium sulfat 1.0 mol dm⁻³.

Berapakah perubahan suhu untuk tindak balas ini?

50 cm³ of 1.0 mol dm⁻³ lead(II) nitrate solution was added to 50 cm³ of 1.0 mol dm⁻³ potassium sulphate solution in a plastic cup. The temperature changes is 2.5 °C. The experiment is repeated by using 50 cm³ of 1.0 mol dm⁻³ lead(II) nitrate solution and 100 cm³ of 1.0 mol dm⁻³ potassium sulphate solution. What is the change in temperature of the reaction?

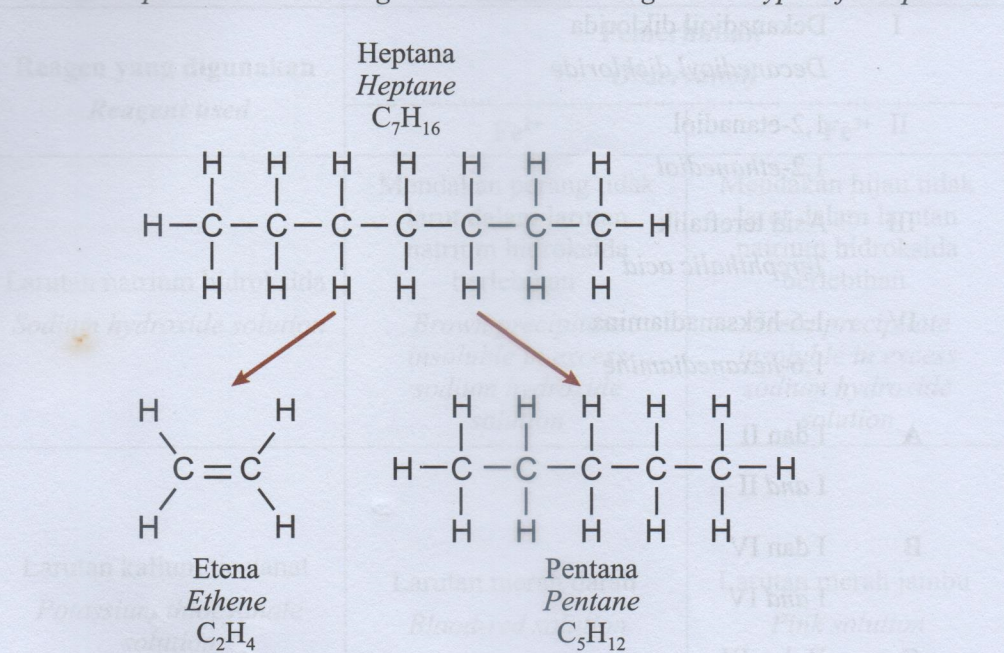
- A 2.5 °C
B 5.0 °C
C 7.5 °C
D 10.0 °C

Table 1

Experiment	Volume of lead(II) nitrate solution / cm ³	Volume of potassium sulphate solution / cm ³	Change in temperature / °C
1	50	50	2.5
2	50	100	7.5

- 33 Rajah 12 menunjukkan satu proses yang mana satu molekul berantai panjang bertukar kepada dua jenis sebatian.

Diagram 12 shows a process which a long chain molecule change to two types of compounds.



Rajah 12
Diagram 12

Apakah nama proses tersebut?

What is the name of the process?

- A Penambahan
Addition
- B Penukargantian
Substitution
- C Peretakan
Cracking
- D Pengesteran
Esterification

34 Antara berikut, yang manakah monomer untuk nilon?

Which of the following are monomers of nylon?

I Dekanadioil diklorida
Decanedioyl dichloride

II 1,2-etanadiol
1,2-ethanediol

III Asid tereftalik
Terephthalic acid

IV 1,6-heksanadiamina
1,6-hexanediamine

A I dan II

I and II

B I dan IV

I and IV

C II dan III

II and III

D III dan IV

III and IV

35 Antara berikut, yang manakah sifat sebatian kovalen?

Which of the following is the property of covalent compound?

A Larut dalam air
Dissolve in water

B Takat lebur dan takat didih yang tinggi
High melting and boiling points

C Mengkonduksikan elektrik dalam keadaan akueus
Conducts electricity in aqueous state

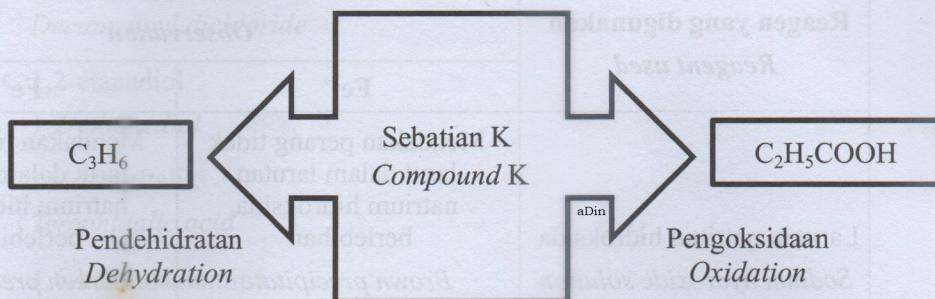
D Tidak mengkonduksikan elektrik dalam keadaan pepejal
Does not conduct electricity in solid state

- 36 Antara berikut, pemerhatian manakah adalah benar untuk ion ferum(II) dan ion ferum(III)?
Which of the following observation obtained is true for iron(II) ion and iron(III) ion?

	Reagen yang digunakan <i>Reagent used</i>	Pemerhatian <i>Observation</i>	
		Fe^{2+}	Fe^{3+}
A	Larutan natrium hidroksida <i>Sodium hydroxide solution</i>	Mendakan perang tidak larut dalam larutan natrium hidroksida berlebihan <i>Brown precipitate insoluble in excess sodium hydroxide solution</i>	Mendakan hijau tidak larut dalam larutan natrium hidroksida berlebihan <i>Green precipitate insoluble in excess sodium hydroxide solution</i>
B	Larutan kalium tiosianat <i>Potassium thiocyanate solution</i>	Larutan merah darah <i>Blood-red solution</i>	Larutan merah jambu <i>Pink solution</i>
C	Larutan kalium manganat(VII) <i>Potassium manganate(VII) solution</i>	Warna ungu larutan kalium manganat(VII) dinyahwarnakan <i>Purple colour of potassium manganate(VII) solution decolourise</i>	Tiada tindak balas <i>No reaction</i>
D	Larutan kalium heksasianoferat(II) <i>Potassium hexacyanoferrate(II) solution</i>	Mendakan biru tua <i>Dark blue precipitate</i>	Mendakan biru muda <i>Light blue precipitate</i>

- 37 Rajah 13 menunjukkan penukaran sebatian K kepada dua sebatian organik melalui proses pengoksidaan dan pendehidratan.

Diagram 13 shows the conversion of compound K to two organic compounds through oxidation process and dehydration process.



Rajah 13
Diagram 13

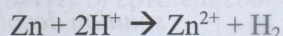
Apakah formula am bagi sebatian K?

What is the general formula for compound K?

- A C_nH_{2n}
- B C_nH_{2n+2}
- C $C_nH_{2n+1}OH$
- D $C_nH_{2n+1}COOH$

- 38 Persamaan ion berikut menunjukkan tindak balas antara zink dengan asid.

The following ionic equation shows the reaction between zinc and acid.

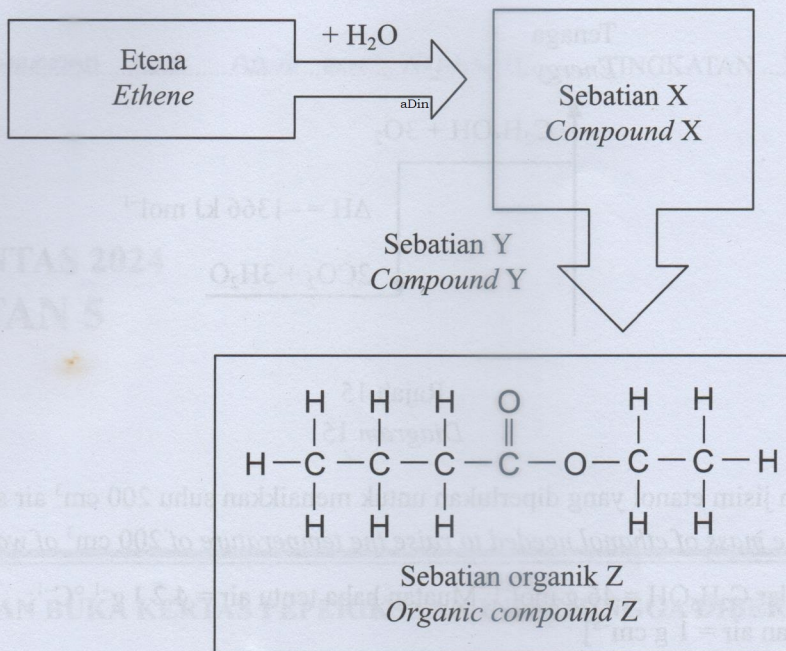


Apakah perubahan nombor pengoksidaan bagi hidrogen?

What is the change in oxidation number for hydrogen?

- A 0 kepada +1
0 to +1
- B 0 kepada +2
0 to +2
- C +1 kepada 0
+1 to 0
- D +1 kepada +2
+1 to +2

- 39 Rajah 14 menunjukkan siri tindak balas bagi menghasilkan sebatian organik Z.
Diagram 14 shows series of reactions to produce organic compound Z.



Rajah 14
Diagram 14

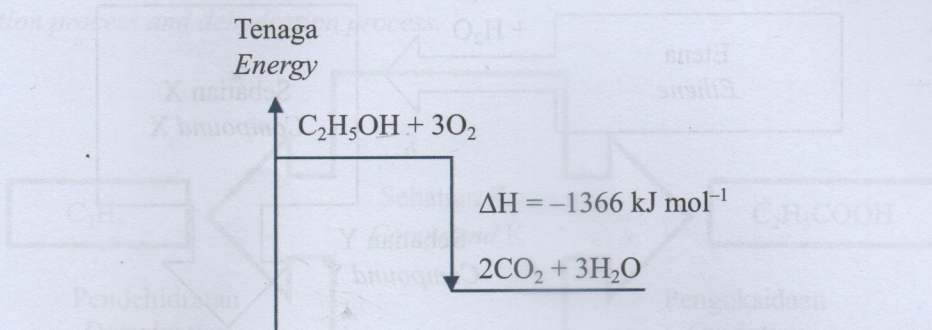
Apakah sebatian X, Y dan Z?

What is compound X, Y and Z?

	Sebatian X Compound X	Sebatian Y Compound Y	Sebatian Z Compound Z
A	Etanol Ethanol	Asid butanoik Butanoic acid	Butil etanoat Butyl ethanoate
B	Etanol Ethanol	Asid butanoik Butanoic acid	Etil butanoat Ethyl butanoate
C	Butanol Butanol	Asid etanoik Ethanoic acid	Etil butanoat Ethyl butanoate
D	Butanol Butanol	Asid etanoik Ethanoic acid	Butil etanoat Butyl ethanoate

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Rajah 15 menunjukkan gambar rajah aras tenaga bagi pembakaran etanol, $\text{C}_2\text{H}_5\text{OH}$.
 Diagram 15 shows the energy level diagram for the combustion of ethanol, $\text{C}_2\text{H}_5\text{OH}$.



Berapakah jisim etanol yang diperlukan untuk menaikkan suhu 200 cm^3 air sebanyak 31.0°C ?

What is the mass of ethanol needed to raise the temperature of 200 cm^3 of water by 31.0°C ?

[Jisim molar $\text{C}_2\text{H}_5\text{OH} = 46 \text{ g mol}^{-1}$; Muatan haba tentu air $= 4.2 \text{ J g}^{-1}^\circ\text{C}^{-1}$;

Ketumpatan air $= 1 \text{ g cm}^{-3}$]

[Molar mass of $\text{C}_2\text{H}_5\text{OH} = 46 \text{ g mol}^{-1}$; Specific heat capacity of water $= 4.2 \text{ J g}^{-1}^\circ\text{C}^{-1}$;

Density of water $= 1 \text{ g cm}^{-3}$]

A 0.202 g

B 0.212 g

C 0.877 g

D 0.887 g