

MODUL PINTAS TINGKATAN LIMA

1 JAM 15 MINIT

4541/1

KIMIA

Kertas 1

ARAHAN :

1. Jangan Buka Kertas Peperiksaan Ini Sehingga Diberitahu.
2. Kertas peperiksaan ini adalah dalam dwibahasa.
3. Soalan dalam bahasa Melayu mendahului soalan yang sepadan dalam bahasa Inggeris.
4. Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.

NAMA :

TINGKATAN :

Kertas peperiksaan ini mengandungi 31 halaman bercetak dan 1 halaman tidak bercetak.

4541/1

[Lihat halaman sebelah

- 1 Apakah yang dilakukan selepas mengumpul data dalam suatu penyiasatan saintifik?
What is done after collecting data in a scientific investigation?
- A Menginterpretasi dan menganalisis data
Interpreting and analysing the data
- B Membuat hipotesis
Making a hypothesis
- C Membina inferens
Constructing an inference
- D Mengenal pasti pemboleh ubah
Identifying the variables
- 2 Antara berikut, yang manakah menunjukkan jisim atom relatif nitrogen yang betul?
Which of the following correctly shows the relative atomic mass of nitrogen?
- A
$$\frac{\text{Purata jisim satu atom nitrogen}}{\text{Jisim satu atom karbon-12}}$$

The average mass of a nitrogen atom
The mass of a carbon-12 atom
- B
$$\frac{\text{Purata jisim satu atom nitrogen}}{12 \times \text{Jisim satu atom karbon-12}}$$

The average mass of a nitrogen atom
12 \times The mass of a carbon-12 atom
- C
$$\frac{\text{Purata jisim satu atom nitrogen}}{\frac{1}{12} \times \text{Jisim satu atom karbon-12}}$$

The average mass of a nitrogen atom
\frac{1}{12} \times The mass of a carbon-12 atom
- D
$$\frac{\text{Jisim satu atom karbon-12}}{\frac{1}{12} \times \text{Purata jisim satu atom nitrogen}}$$

The mass of a carbon-12 atom
\frac{1}{12} \times The average mass of a nitrogen atom

5 Antara berikut, yang manakah satu contoh agen pengoksidaan?

Which of the following is an example of oxidising agent?

- A Air klorin
Chlorine water
- B Logam magnesium
Magnesium metal
- C Larutan natrium iodida
Sodium iodide solution
- D Larutan ferum(II) sulfat
Iron(II) sulphate solution

6 Antara pernyataan berikut, yang manakah benar tentang tindak balas eksotermik?

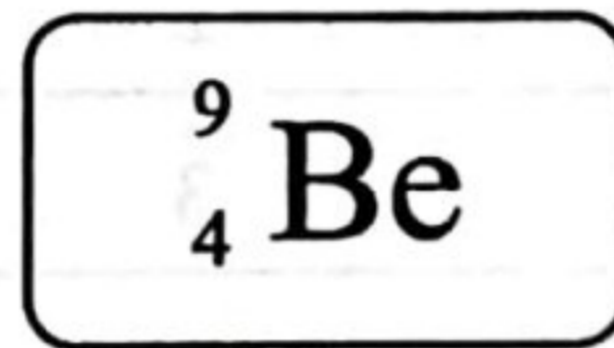
Which of the following statements is true about exothermic reactions?

- A Menyebabkan suhu persekitarannya meningkat
Cause the temperature of the surroundings to increase
- B Tindak balas yang menyerap tenaga haba dari persekitaran
Reactions that absorb heat energy from the surroundings
- C Hasil tindak balas mengandungi lebih banyak tenaga berbanding dengan bahan tindak balas
The products contain more energy than the reactants

- 7 Aiskrim mengandungi minyak dan air yang tidak bercampur.
Antara bahan tambah makanan berikut, yang manakah ditambah untuk mengatasi keadaan ini?
Ice cream contains oil and water that do not mix.
Which of the following food additive is added to overcome the situation?

- A Pengemulsi
Emulsifiers
- B Antioksidan
Antioxidants
- C Pemekat
Thickeners
- D Penstabil
Stabilisers

- 8 Rajah 1 menunjukkan simbol perwakilan piawai bagi atom berilium.
Diagram 1 shows the standard representation symbol of beryllium atom.

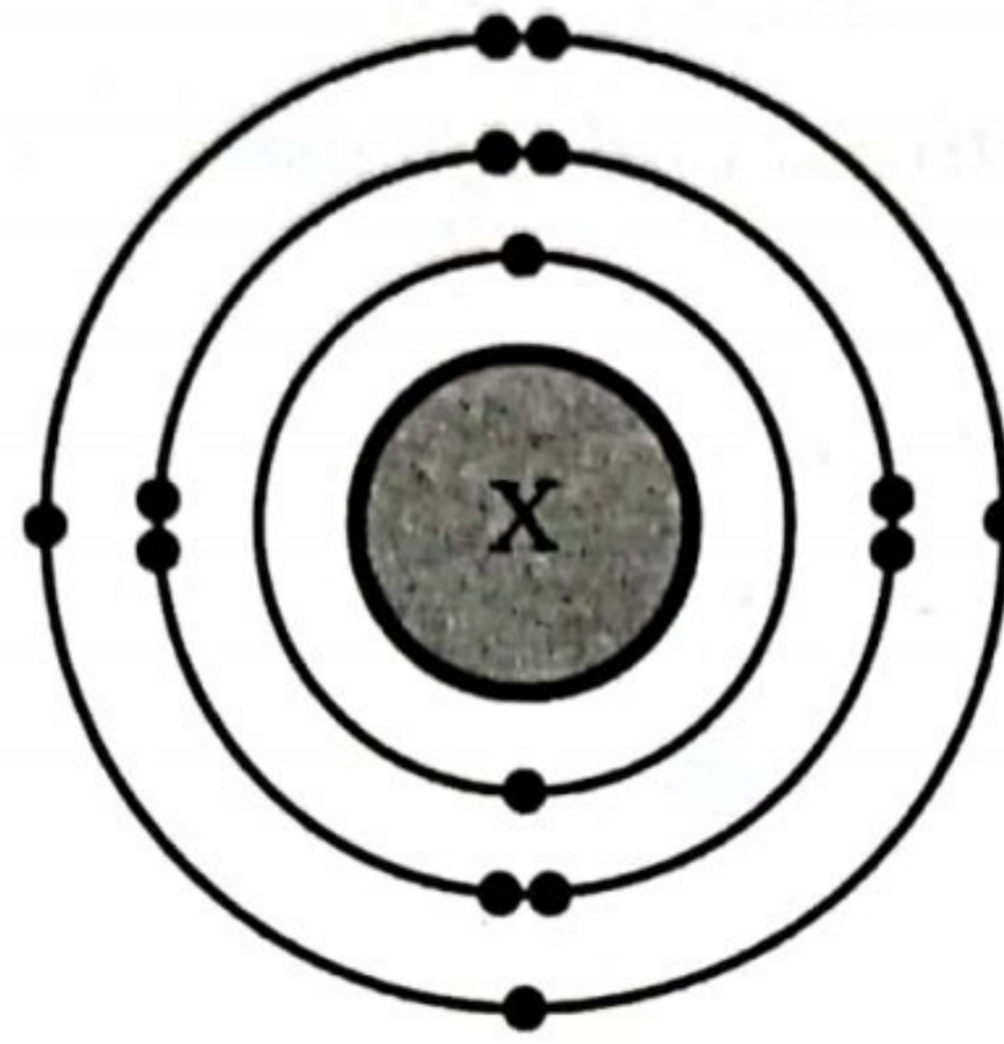


Rajah 1
Diagram 1

Apakah bilangan proton bagi atom berilium?
What is the number of protons for beryllium atom?

- A 2
- B 3
- C 4
- D 9

- 9 Rajah 2 menunjukkan susunan elektron bagi atom X.
Diagram 2 shows the electron arrangement of an atom X.



Rajah 2
Diagram 2

Antara berikut, yang manakah kedudukan unsur X dalam Jadual Berkala Unsur?
Which of the following is the position of element X in the Periodic Table of Elements?

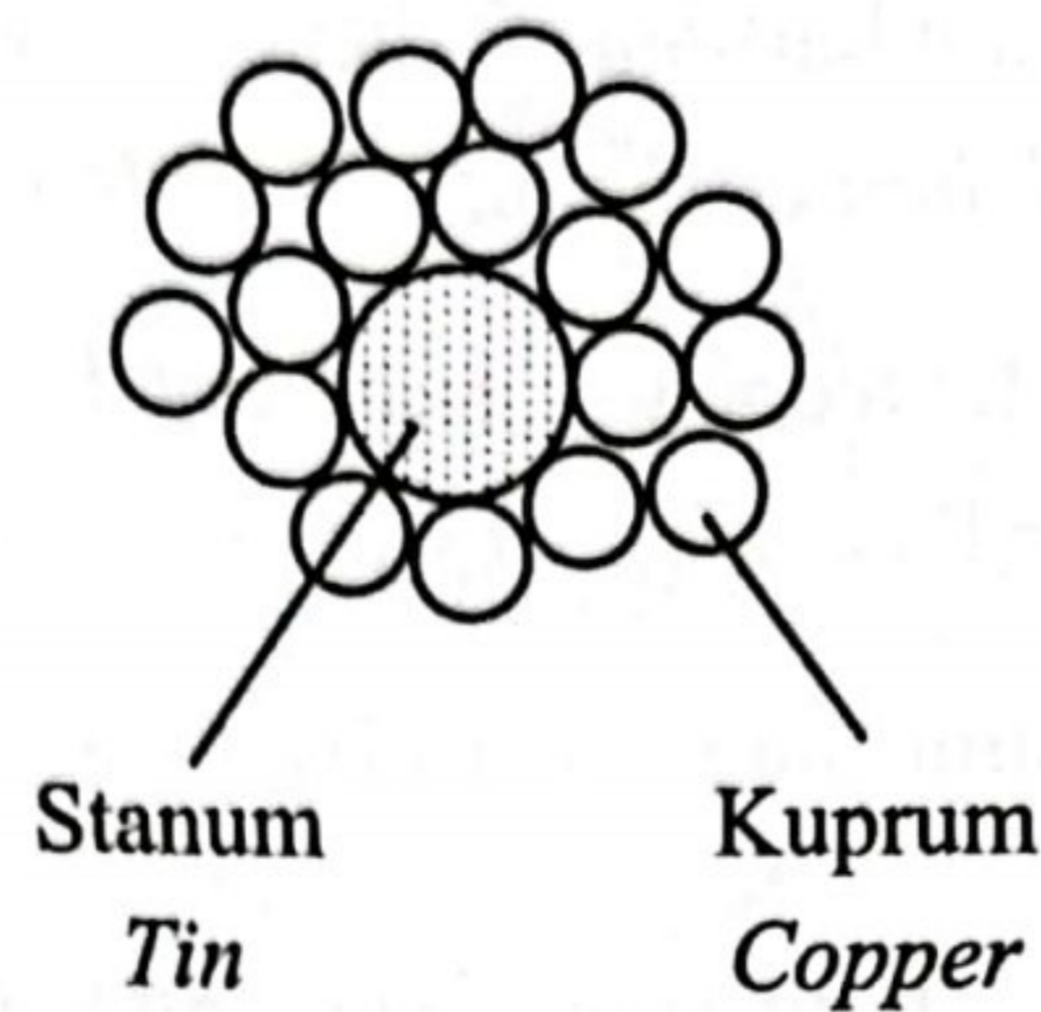
	Kumpulan Group	Kala Period
A	5	2
B	5	3
C	15	2
D	15	3

10 Antara tindak balas berikut, yang manakah tindak balas peneutralan?

Which of the following reactions is a neutralisation reaction?

- A** Asid hidroklorik + Kalsium karbonat → Kalsium klorida + Air + Karbon dioksida
Hydrochloric acid + Calcium carbonate → Calcium chloride + Water + Carbon dioxide
- B** Asid sulfurik + Kuprum(II) oksida → Kuprum(II) sulfat + Air
Sulphuric acid + Copper(II) oxide → Copper(II) sulphate + Water
- C** Asid hidroklorik + Kalium manganat(VII) → Kalium klorida + Mangan(II) klorida + Klorin + Air
Hydrochloric acid + Potassium manganate(VII) → Potassium chloride + Manganese(II) chloride + Chlorine + Water
- D** Asid sulfurik + Zink → Zink sulfat + Gas hidrogen
Sulphuric acid + Zinc → Zinc sulphate + Hydrogen gas

- 11 Rajah 3 menunjukkan susunan atom dalam gangsa.
Diagram 3 shows the arrangement of atoms in bronze.

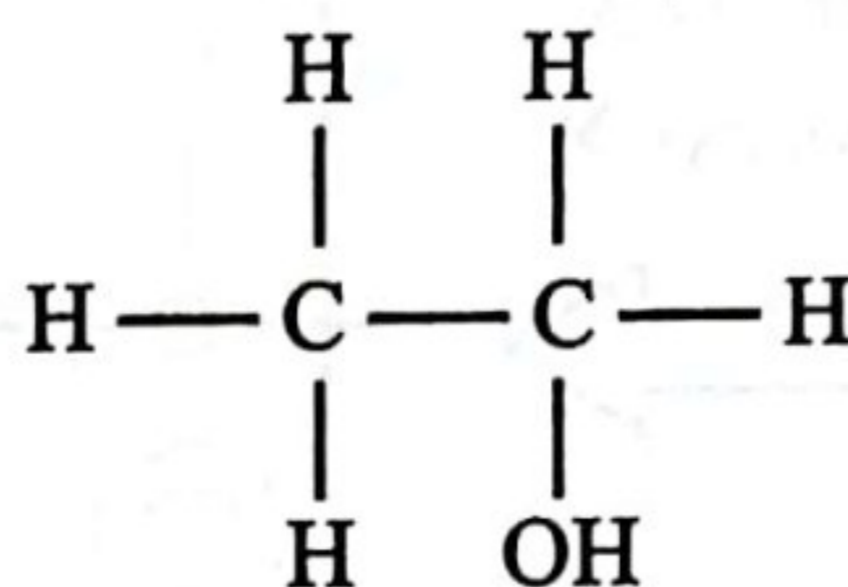


Rajah 3
Diagram 3

Apakah fungsi atom stanum?
What is the function of tin atom?

- A** Untuk menambahkan ruang antara atom-atom kuprum
To increase space between copper atoms
- B** Untuk mencegah kuprum mengalami pengoksidaan
To prevent copper undergoes oxidation
- C** Untuk menguatkan ikatan antara atom-atom kuprum
To strengthen the bond between copper atoms
- D** Untuk mengurangkan lapisan atom-atom kuprum daripada menggelongsor dengan mudah
To reduce the layer of copper atoms from sliding easily

- 12 Rajah 4 menunjukkan formula struktur sebatian organik yang boleh dihasilkan daripada etena.
Diagram 4 shows the structural formula of organic compound that could be produced from ethene.



Rajah 4
Diagram 4

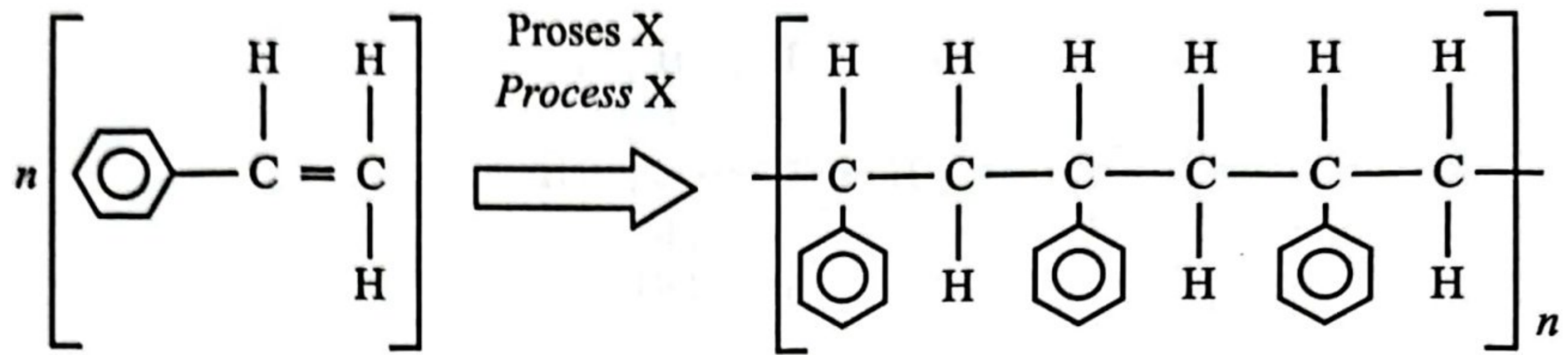
Apakah nama tindak balas yang menghasilkan sebatian ini daripada etena?

What is the name of the reaction that produces the compound from ethene?

- A Penghidratan
Hydration
- B Pendehidratan
Dehydration
- C Pengoksidaan
Oxidation
- D Penghidrogenan
Hydrogenation

13 Rajah 5 menunjukkan proses X.

Diagram 5 shows process X.



Rajah 5
Diagram 5

Apakah proses X?

What is process X?

- A Pempolimeran
Polymerisation
- B Pengesteran
Esterification
- C Penghidrogenan
Hydrogenation
- D Pengoksidaan
Oxidation

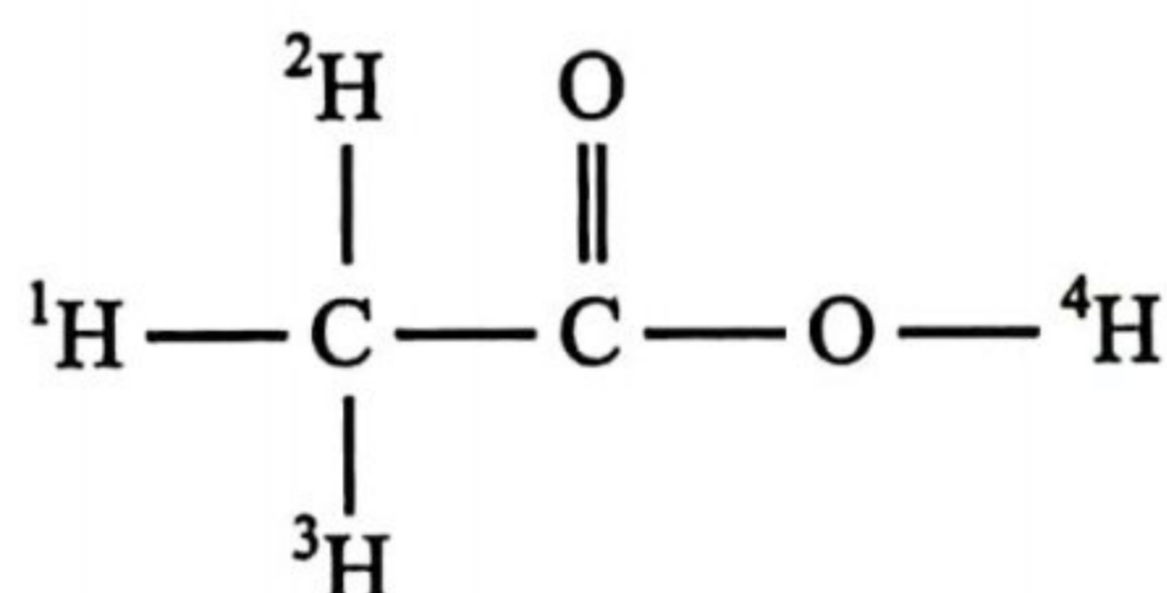
- 14 Karbon-12 dan karbon-14 merupakan isotop.
Apakah persamaan yang dimiliki oleh kedua-dua atom ini?
Carbon-12 and carbon-14 are isotopes.
What is the similarities do both atoms have?

- I Bilangan proton
Number of protons
 - II Bilangan neutron
Number of neutrons
 - III Sifat fizik
Physical properties
 - IV Sifat kimia
Chemical properties
- 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

- 15 Antara berikut, yang manakah wujud sebagai gas monoatom?
Which of the following exists as monoatomic gas?
- A Klorin
Chlorine
 - B Oksigen
Oxygen
 - C Argon
Argon
 - D Hidrogen
Hydrogen
- 16 Antara garam berikut, yang manakah menghasilkan logam oksida dan gas berwarna perang apabila dipanaskan dengan kuat?
Which of the following salts produces a metal oxide and brown gas when heated strongly?
- A Kuprum(II) nitrat
Copper(II) nitrate
 - B Magnesium sulfat
Magnesium sulphate
 - C Kuprum(II) karbonat
Copper(II) carbonate
 - D Natrium klorida
Sodium chloride

- 17 Apakah bahan yang ditambahkan kepada kaca untuk menghasilkan kaca fotokromik?
What substance is added to glass to produce photochromic glass?
- A Argentum klorida
Silver chloride
 - B Aluminium klorida
Aluminium chloride
 - C Natrium bromida
Sodium bromide
 - D Kalsium bromida
Calcium bromide

- 18 Rajah 6 menunjukkan formula struktur bagi asid etanoik.
Diagram 6 shows the structural formula of ethanoic acid.



Rajah 6
Diagram 6

Antara berikut, atom hidrogen yang manakah akan terlibat dalam tindak balas kimia?
Which of the following hydrogen atom will be involved in a chemical reaction?

- A ${}^1\text{H}$
- B ${}^2\text{H}$
- C ${}^3\text{H}$
- D ${}^4\text{H}$

- 19 Apabila suatu bahan R ditambahkan kepada lateks, proses penggumpalan lateks menjadi perlahan. Apakah R?

When a substance R is added to latex, the process of coagulation of latex slows down. What is R?

- A Air
Water
- B Etanol
Ethanol
- C Asid etanoik
Ethanoic acid
- D Ammonia akueus
Aqueous ammonia

- 20 Antara berikut, bahan manakah yang mempunyai bilangan atom yang sama seperti dalam 0.2 mol gas hidrogen, H_2 ?

Which of the following substances contain the same number of atoms as in 0.2 moles of hydrogen gas, H_2 ?

- I 0.1 mol gas argon, Ar
0.1 moles of argon gas, Ar
- II 0.2 mol air, H_2O
0.2 moles of water, H_2O
- III 0.1 mol sulfur trioksida, SO_3
0.1 moles of sulphur trioxide, SO_3
- IV 0.4 mol magnesium, Mg
0.4 moles of magnesium, Mg
- 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

21. Jadual 1 menunjukkan nombor proton bagi empat unsur.
Table 1 shows the proton number of four elements.

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

Jadual 1

Table 1

Antara pasangan unsur-unsur berikut, yang manakah membentuk sebatian yang tak terlarut dalam air?

Which of the following pair of elements forms a compound that is insoluble in water?

- A W dan Z
W and Z
- B X dan Z
X and Z
- C Y dan Z
Y and Z
- D W dan Y
W and Y

22 Jadual 2 menunjukkan dua tindak balas kimia, P dan Q.

Table 2 shows two chemical reactions, P and Q.

Tindak balas <i>Reaction</i>	Bahan tindak balas <i>Reactants</i>
P	25 cm ³ asid hidroklorik 0.5 mol dm ⁻³ + pita magnesium pada suhu bilik 25 cm ³ of 0.5 mol dm ⁻³ hydrochloric acid + magnesium ribbon at room temperature
Q	25 cm ³ asid hidroklorik 0.2 mol dm ⁻³ + pita magnesium pada suhu bilik 25 cm ³ of 0.2 mol dm ⁻³ hydrochloric acid + magnesium ribbon at room temperature

Jadual 2

Table 2

Pernyataan yang manakah menjelaskan mengapa kadar tindak balas P lebih tinggi daripada kadar tindak balas Q?

Which statement explains why the rate of reaction P is higher than the rate of reaction Q?

- A Jumlah luas permukaan bahan tindak balas yang lebih tinggi
The total surface area of reactants is higher
- B Terdapat lebih banyak molekul bahan tindak balas per unit isi padu
There are more reactant molecules per unit volume
- C Molekul bahan tindak balas mengandungi tenaga kinetik yang lebih tinggi
The reactant molecules contain higher kinetic energy
- D Tenaga pengaktifan tindak balas yang lebih rendah
The activation energy of the reaction is lower

- 23 Rajah 7 menunjukkan mekanisme pengurangan besi.
Diagram 7 shows the mechanism of rusting of iron.



Rajah 7
Diagram 7

Tindak balas yang manakah berlaku di anod?

Which reaction occurred at the anode?

- A $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$
 B $\text{Fe} \rightarrow \text{Fe}^{3+} + 3\text{e}^-$
 C $\text{H}_2 \rightarrow 2\text{H}^+ + 2\text{e}^-$
 D $4\text{OH}^- \rightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$
- 24 Persamaan berikut menunjukkan tindak balas antara ion Ca^{2+} dan ion SO_4^{2-} .
The following equation shows the reaction between Ca^{2+} ion and SO_4^{2-} ion.



Antara pernyataan berikut, yang manakah benar tentang persamaan ini?

Which of the following statements is true about the equation?

- A 56 kJ haba diserap apabila 1 mol kalsium sulfat dihasilkan
56 kJ of heat is absorbed when 1 mole of calcium sulphate is produced
- B Haba dibebaskan ke persekitaran
Heat is released to the surroundings
- C Tindak balas itu adalah endotermik
The reaction is endothermic
- D Suhu persekitaran berkurang semasa tindak balas
The temperature of surroundings decreases during the reaction

- 25 Maklumat berikut adalah mengenai sejenis ubat.
The following information is about a type of drug.

- Melegakan sakit dalam keadaan sedar
Relieves pain in conscious state
- Bersifat asid
Acidic
- Menyebabkan ulser perut pada kanak-kanak
Causes stomach ulcer on children

Antara berikut, yang manakah ubat yang dinyatakan?
Which of the following is the specified drug?

- A Kodeina
Codeine
- B Antibiotik
Antibiotics
- C Klozapin
Clozapine
- D Aspirin
Aspirin
- 26 Dalam satu tindak balas kimia, didapati 2.16 g magnesium telah bertindak balas selengkapnya dengan 0.84 g nitrogen.
Apakah formula empirik sebatian yang terhasil?
[Jisim atom relatif: N = 14, Mg = 24]
In a chemical reaction, it was found that 2.16 g of magnesium reacted completely with 0.84 g of nitrogen.
What is the empirical formula of the compound formed?
[Relative atomic mass: N = 14, Mg = 24]
- A MgN_3
- B Mg_2N_3
- C Mg_3N
- D Mg_3N_2

- 27 Tindak balas antara logam zink dan asid hidroklorik menghasilkan garam zink klorida dan gas hidrogen.

Apakah jisim logam zink yang perlu bertindak balas dengan asid hidroklorik berlebihan untuk mendapat 2.72 g garam zink klorida?

[Jisim atom relatif: Zn = 65, Cl = 35.5]

The reaction between zinc metal and hydrochloric acid produces zinc chloride salt and hydrogen gas.

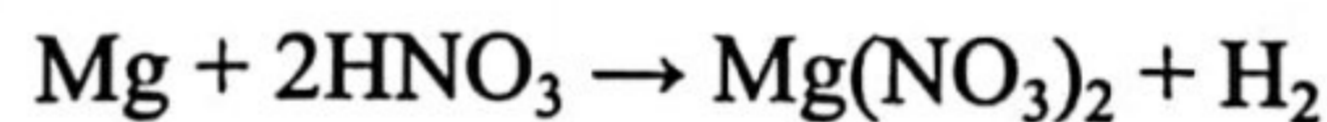
What is the mass of zinc metal that needs to react with excess hydrochloric acid to obtain 2.72 g of zinc chloride salt?

[Relative atomic mass: Zn = 65, Cl = 35.5]

- A 0.65 g
- B 1.30 g
- C 1.95 g
- D 2.60 g

- 28 Seorang pelajar memperoleh 0.05 mol magnesium nitrat melalui tindak balas antara pita magnesium berlebihan dengan 50 cm³ asid nitrik. Tindak balas yang berlaku diwakili persamaan berikut.

A student obtained 0.05 moles magnesium nitrate from the reaction between excess magnesium ribbon with 50 cm³ nitric acid. The reaction that occurred is represented by the following equation.

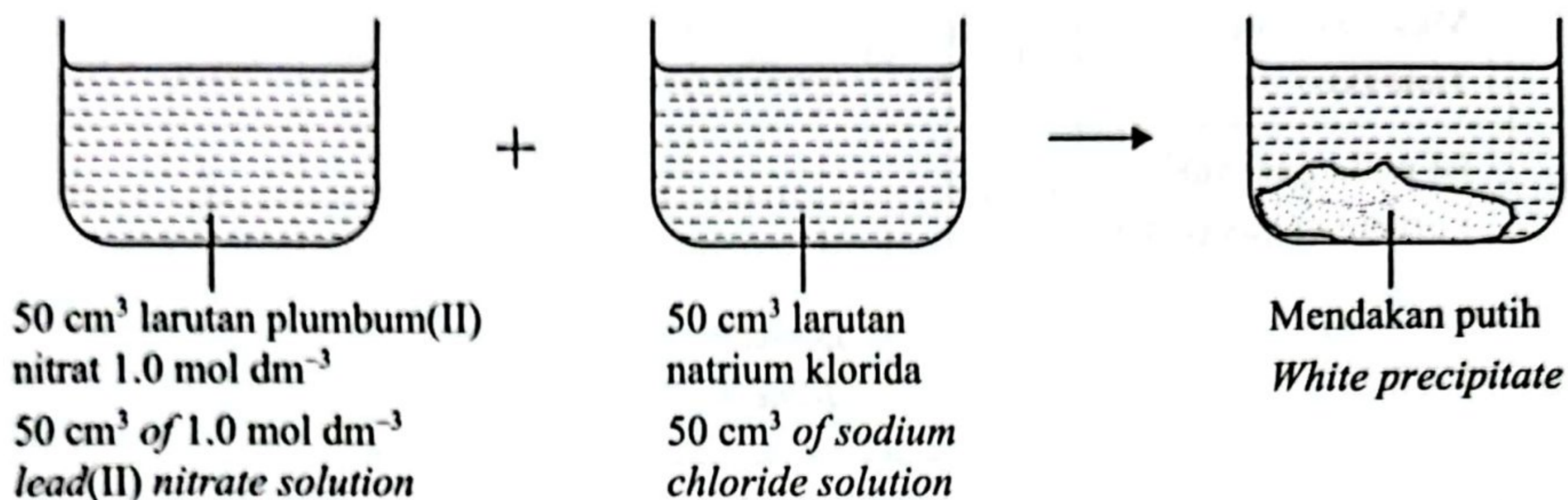


Apakah kemolaran asid nitrik yang digunakan?

What is the molarity of the nitric acid used?

- A 0.5 mol dm⁻³
- B 1.0 mol dm⁻³
- C 2.0 mol dm⁻³
- D 4.0 mol dm⁻³

- 29 Rajah 8 menunjukkan penyediaan plumbum(II) klorida.
Diagram 8 shows the preparation of lead(II) chloride.



Rajah 8
Diagram 8

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

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

- A 0.5 mol dm⁻³
- B 1.0 mol dm⁻³
- C 1.5 mol dm⁻³
- D 2.0 mol dm⁻³

- 30 Jadual 3 menunjukkan keputusan eksperimen untuk menentukan kadar tindak balas.
Table 3 shows the results obtained to determine the rate of reaction.

Masa (s) <i>Time (s)</i>	0	30	60	90	120	150	180	210
Isi padu gas (cm³) <i>Volume of gas (cm³)</i>	12.00	22.00	30.00	36.00	40.00	42.00	42.00	42.00

Jadual 3
 Table 3

Apakah kadar tindak balas purata dari 60 s ke 150 s?
What is the average rate of reaction from 60 s to 150 s?

- A 0.110 cm³ s⁻¹
 B 0.133 cm³ s⁻¹
 C 0.220 cm³ s⁻¹
 D 0.343 cm³ s⁻¹
- 31 0.20 mol serbuk zink bertindak balas dengan asid nitrik cair berlebihan. Selepas 5 minit, 0.05 mol zink tertinggal sebagai baki.
 Apakah kadar tindak balas purata keseluruhan?
 [Jisim atom relatif: Zn = 65]
0.20 moles of zinc powder react with excess dilute nitric acid. After 5 minutes, 0.05 moles of zinc remains as residue.
What is the overall average rate of reaction?
 [Relative atomic mass: Zn = 65]
- A 0.65 g min⁻¹
 B 1.95 g min⁻¹
 C 2.60 g min⁻¹
 D 3.25 g min⁻¹

- 32 Jadual 4 menunjukkan jisim molekul relatif dan haba pembakaran bagi empat jenis bahan api.
 Table 4 shows the relative molecular mass and the heat of combustion of four types of fuel.

Bahan api <i>Fuel</i>	Jisim molekul relatif <i>Relative molecular mass</i>	Haba pembakaran, kJ mol ⁻¹ <i>Heat of combustion, kJ mol⁻¹</i>
K	16	-520
L	28	-940
M	46	-1 680
N	72	-2 250

Jadual 4

Table 4

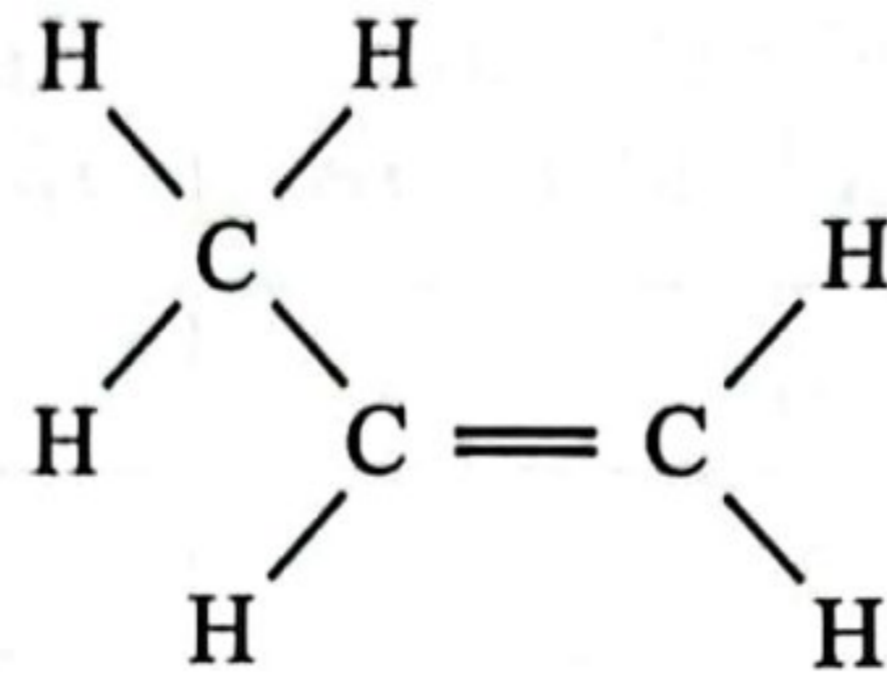
Dari segi nilai bahan api, bahan api yang manakah paling baik?

In terms of fuel value, which fuel is the best?

- A K
- B L
- C M
- D N
- 33 Siri homolog yang manakah mempunyai formula am $C_nH_{2n+1}COOC_mH_{2m+1}$ di mana $n = 0, 1, 2, \dots$ dan $m = 1, 2, 3, \dots$?
- Which homologous series has the general formula of $C_nH_{2n+1}COOC_mH_{2m+1}$ where $n = 0, 1, 2, \dots$ and $m = 1, 2, 3, \dots$?*
- A Alkohol
Alcohol
- B Asid karboksilik
Carboxylic acid
- C Ester
Ester
- D Alkuna
Alkyne

34 Rajah 9 menunjukkan formula struktur bagi suatu monomer.

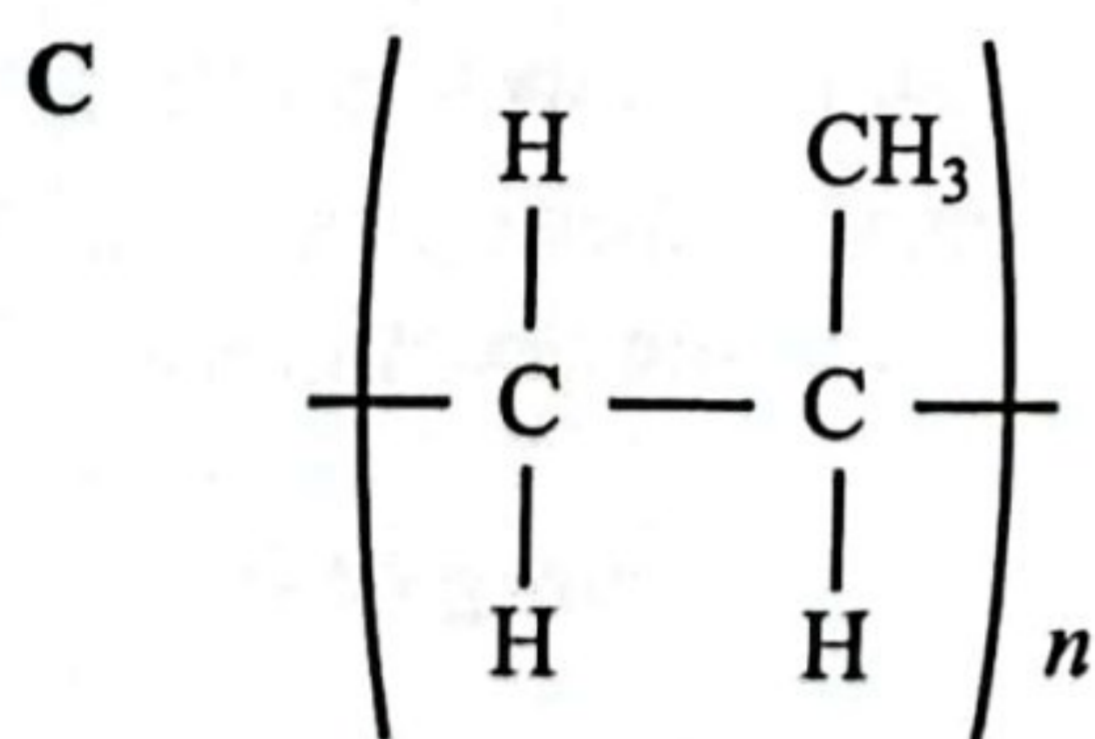
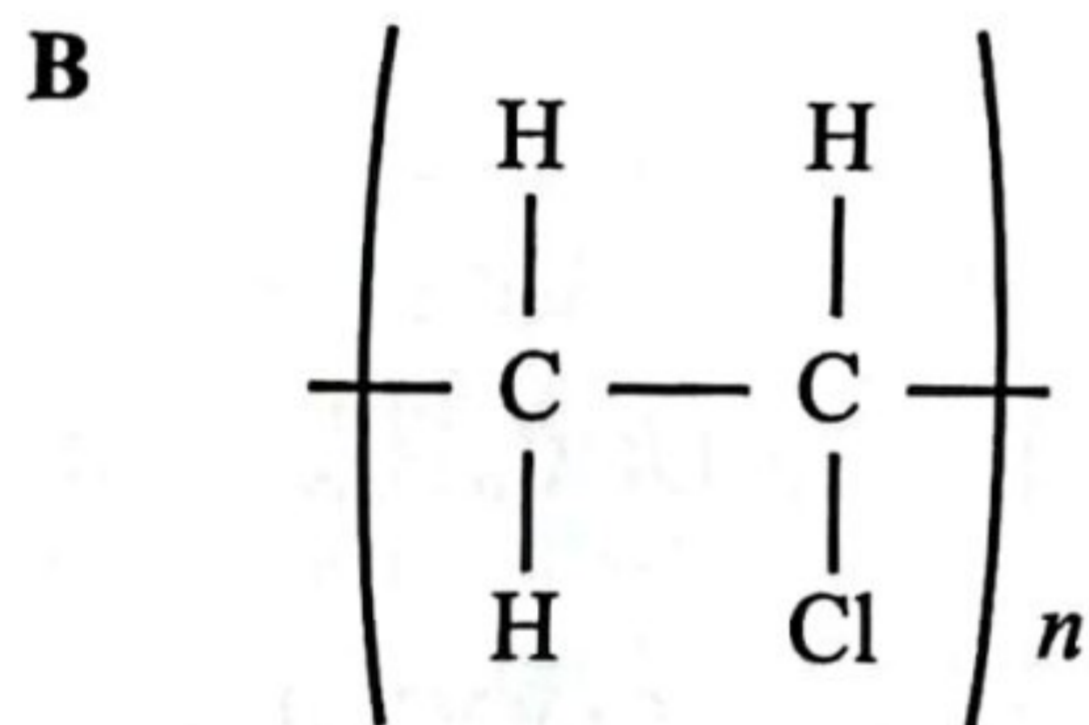
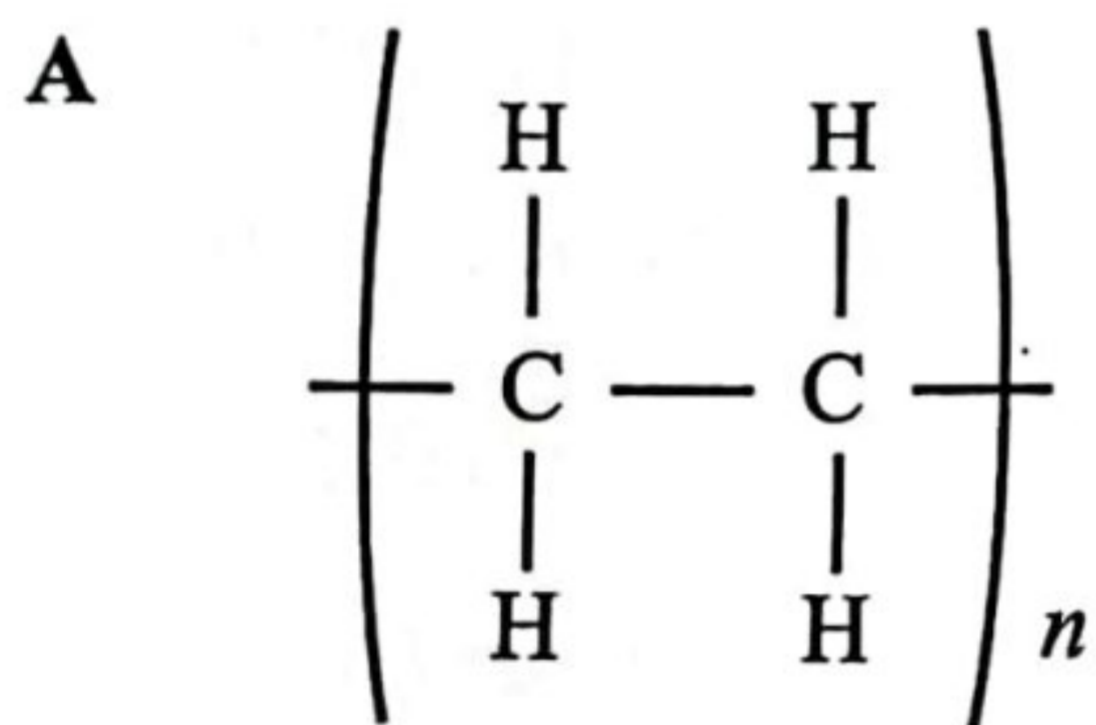
Diagram 9 shows the structural formula of a monomer.



Rajah 9
Diagram 9

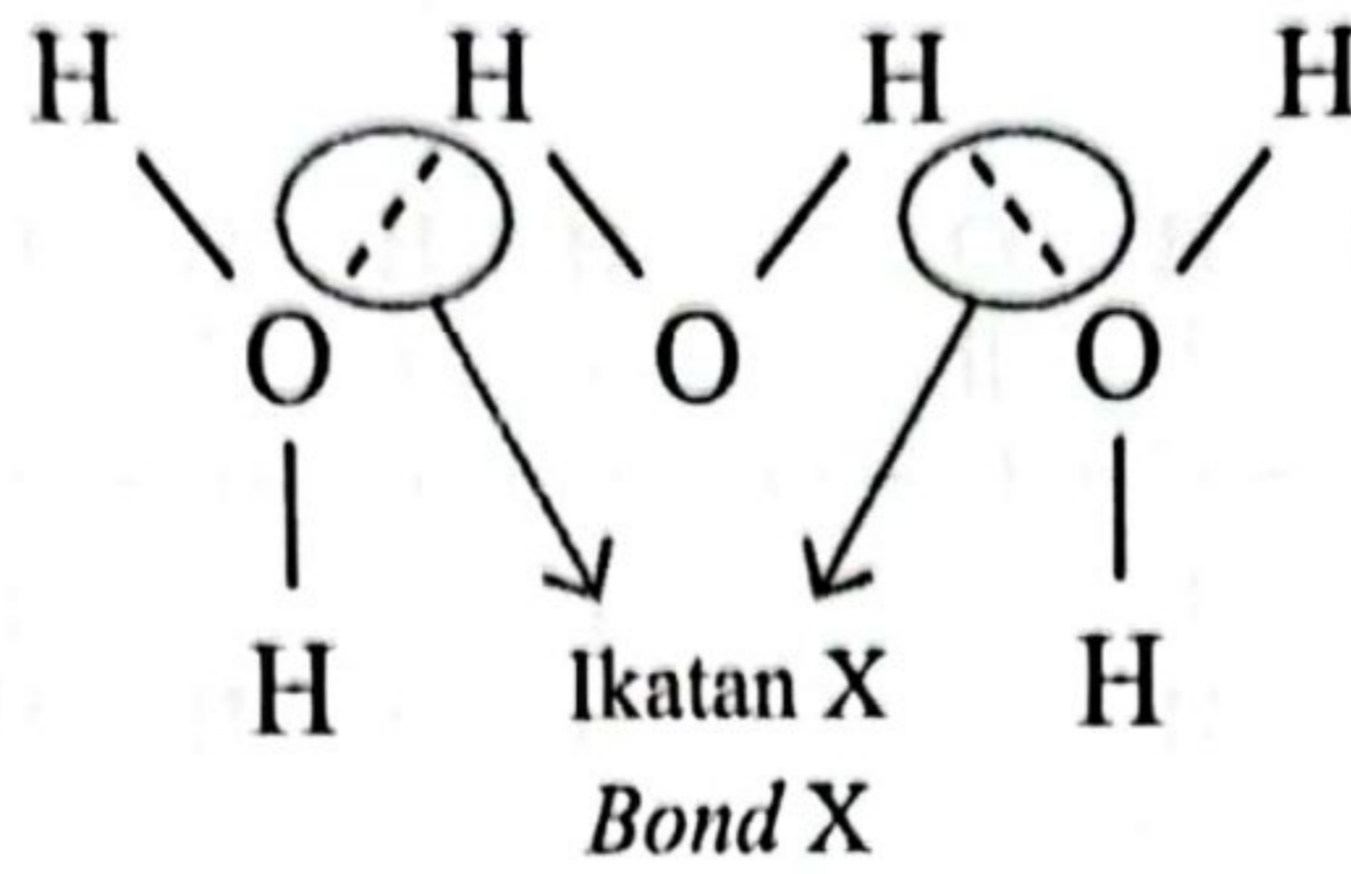
Antara berikut, yang manakah formula struktur bagi polimer terbentuk?

Which of the following is the structural formula for the polymer formed?



35 Rajah 10 menunjukkan ikatan yang terbentuk dalam air.

Diagram 10 shows the bond formed in water.



Rajah 10
Diagram 10

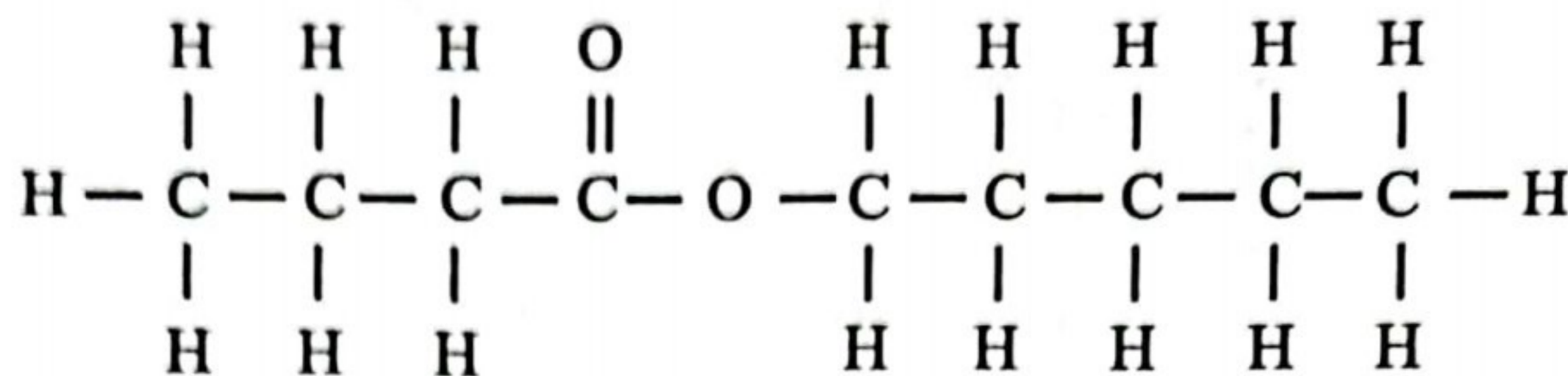
Apakah ikatan X?

What is bond X?

- A Ikatan datif
Dative bond
- B Ikatan hidrogen
Hydrogen bond
- C Ikatan kovalen
Covalent bond
- D Ikatan ion
Ionic bond

- 36 Rajah 11 menunjukkan formula struktur bagi suatu sebatian yang digunakan sebagai perisa pisang tiruan.

Diagram 11 shows a structural formula of a compound that is used as an artificial banana flavouring.



Rajah 11
Diagram 11

Apakah bahan tindak balas bagi menghasilkan sebatian ini?

What is the reactants used to produce this compound?

- A Butanol + Asid butanoik
Butanol + Butanoic acid
- B Butanol + Asid pentanoik
Butanol + Pentanoic acid
- C Pentanol + Asid butanoik
Pentanol + Butanoic acid
- D Pentanol + Asid pentanoik
Pentanol + Pentanoic acid

- 37 Jadual 5 menunjukkan pemerhatian untuk ujian-ujian yang dilakukan ke atas larutan yang mengandungi kation W.

Table 5 shows the observations obtained for tests which carried out on solutions that contained cations W.

Ujian Test	Pemerhatian Observation
Ditambahkan dengan ammonia akueus <i>Added with aqueous ammonia</i>	Mendakan putih terbentuk <i>White precipitate is formed</i>
Ditambahkan dengan larutan natrium klorida <i>Added with sodium chloride solution</i>	Mendakan putih terbentuk <i>White precipitate is formed</i>
Ditambahkan dengan asid sulfurik cair <i>Added with dilute sulphuric acid</i>	Mendakan putih terbentuk <i>White precipitate is formed</i>

Jadual 5

Table 5



Apakah kation W?

What is cation W?

- A Zn^{2+}
- B Pb^{2+}
- C Al^{3+}
- D Mg^{2+}

- 38 Rajah 12 menunjukkan pemerhatian eksperimen untuk mengkaji kesan logam ke atas pengurangan besi.

Diagram 12 shows the observation for an experiment to investigate the effect of metals on the rusting of iron.

Tabung uji Test tube	Susunan radas Set-up of apparatus	Pemerhatian Observation
P	 <p>Paku besi dililit dengan logam X Iron nail is coiled with metal X</p>	<p>Tompok merah jambu terbentuk Pink spot is formed</p>
Q	 <p>Paku besi dililit dengan logam Y Iron nail is coiled with metal Y</p>	<p>Tompok biru terbentuk Blue spot is formed</p>

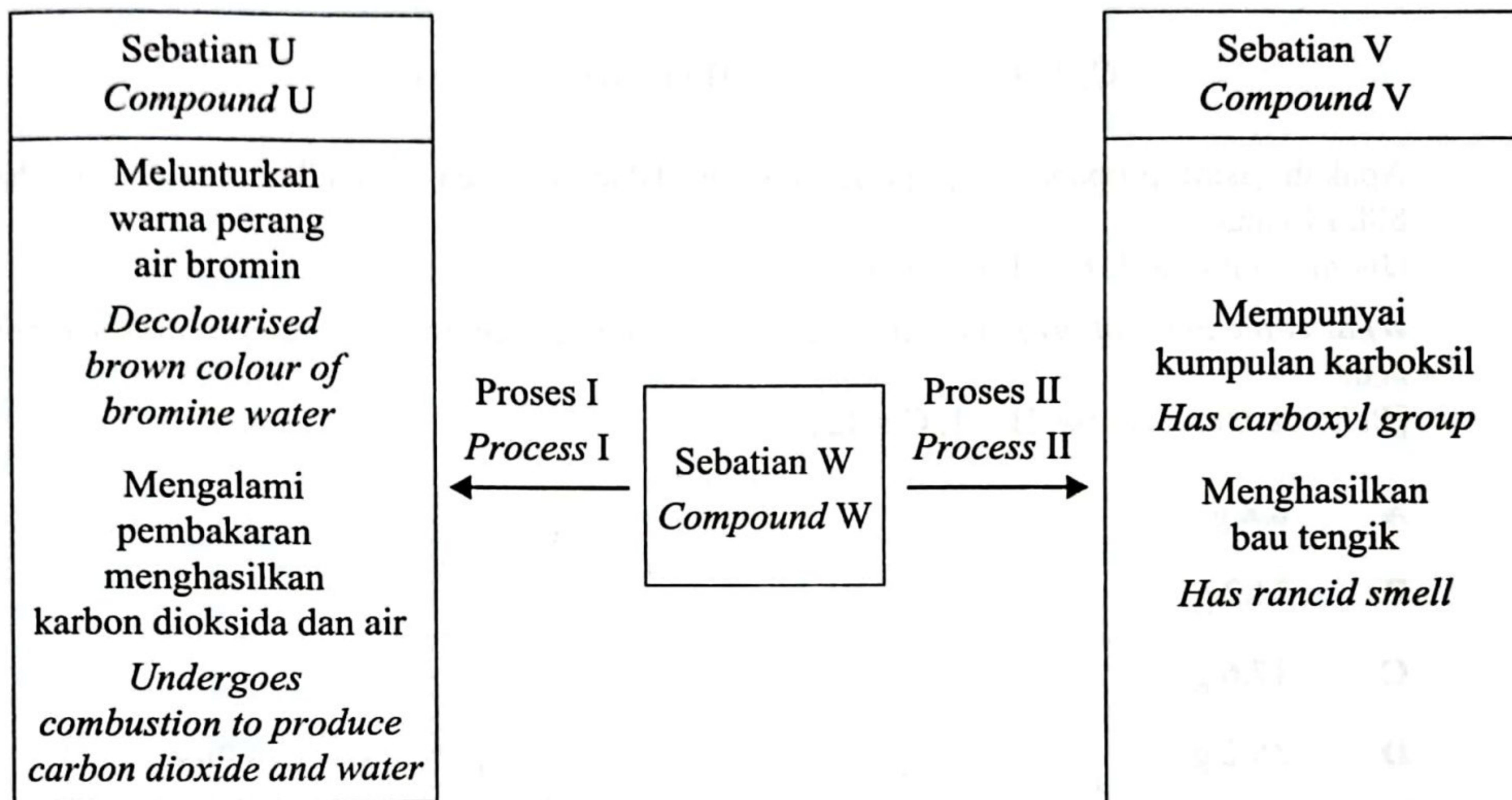
Rajah 12
Diagram 12

Berdasarkan pemerhatian, susun besi, logam X dan logam Y mengikut tertib menaik keelektropositifan.

Based on the observation, arrange iron, metal X and metal Y in ascending order of electropositivity.

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

- 39 Rajah 13 menunjukkan dua proses melibatkan sebatian W.
Diagram 13 shows two processes involving compound W.

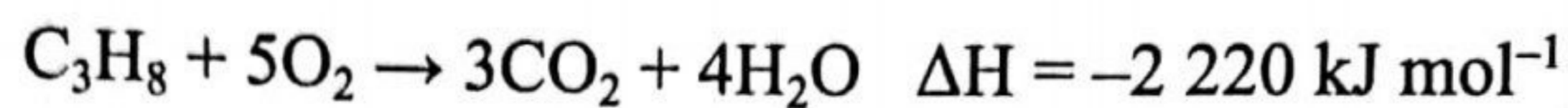


Rajah 13
Diagram 13

Formula struktur yang manakah mewakili sebatian W?
Which structural formula represents compound W?

- A**
- $$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H} - \text{C} = \text{C} - \text{H} \end{array}$$
- B**
- $$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{H} - \text{C} - \text{C} - \text{H} \\ | \quad | \\ \text{H} \quad \text{H} \end{array}$$
- C**
- $$\begin{array}{c} \text{H} \quad \text{O} \\ | \quad || \\ \text{H} - \text{C} - \text{C} - \text{OH} \\ | \\ \text{H} \end{array}$$
- D**
- $$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \\ \text{H} - \text{C} - \text{C} - \text{C} - \text{OH} \\ | \quad | \quad | \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$$

- 40 Persamaan berikut menunjukkan pembakaran propana dalam oksigen berlebihan.
The following equation shows the combustion of propane in excess oxygen.



Apakah jisim propana yang perlu dibakar dalam oksigen berlebihan untuk menghasilkan 888 kJ haba?

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

What is the mass of propane that needs to be combusted in excess oxygen to produce 888 kJ of heat?

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

- A 8.8 g
- B 13.2 g
- C 17.6 g
- D 35.2 g

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

Selamat mengulangkaji dari telegram@soalanpercubaanspm