

Nama : Kelas :



فَرَسَيْدُكَ عَنْ قَعْنَوَادِازِ مَجْلِسِ قَحْتَوِ
مَعْمَلَكِرْجَانِ سَكْوَلَهْ مَنَعَبَوَكَاوَكَاوَا (عَرَب) بَنِيَوَانِ
يَايَا سَنِ إِسْلَامِ كَلَنْتَن



Kimia
Kertas 1 (4541/1)
September 2024
1 jam 15 min

**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA
TAHUN 2024 M / 1446 H**

**KIMIA
KERTAS 1**

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Tulis nama dan tingkatan anda pada ruang yang disediakan.
2. Kertas soalan ini mengandungi 40 soalan.
3. Jawab semua soalan.
4. Bagi setiap soalan, pilih satu jawapan sahaja. Hitamkan jawapan anda pada kertas jawapan objektif yang disediakan.
5. Kertas peperiksaan ini adalah dalam dwibahasa.
6. Kertas jawapan objektif hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

Kertas soalan ini mengandungi 22 halaman bercetak dan 2 halaman tidak bercetak

SULIT

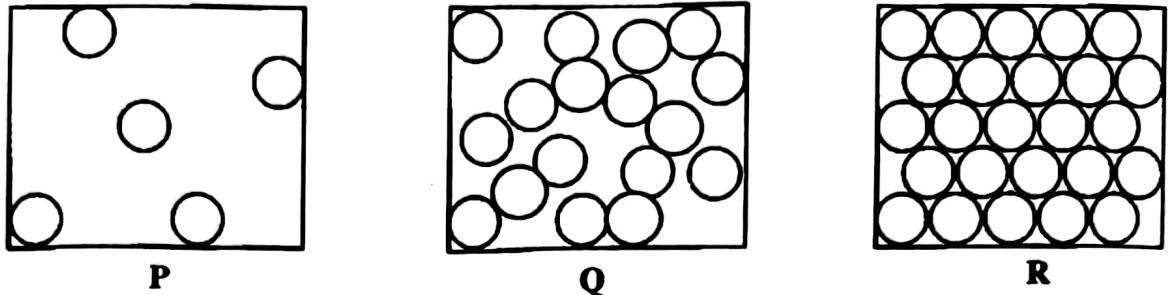
PERCUBAAN SPM YIK KIMIA K1

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[LIHAT HALAMAN SEBELAH

1. Rajah 1 menunjukkan susunan zarah dalam tiga keadaan jirim pada suhu bilik.

Diagram shows the arrangement of particles in three states of matter at room temperature.



Rajah 1 / Diagram 1

Apakah bahan P, Q dan R pada suhu bilik?

What are substances P, Q and R at room temperature?

	P	Q	R
A	Air Water	Glukosa Glucose	Hidrogen Hydrogen
B	Air Water	Hidrogen Hydrogen	Glukosa Glucose
C	Glukosa Glucose	Hidrogen Hydrogen	Air Water
D	Hidrogen Hydrogen	Air Water	Glukosa Glucose

2. Formula kimia bagi kuprum(I) oksida ialah
Chemical formula of copper(I) oxide is

- A CuO
B CuO₂
C Cu₂O
D Cu₂O₂

3. Antara berikut, pernyataan manakah yang **benar** tentang perubahan sifat unsur yang berlaku apabila merentasi Kala 3 dalam Jadual Berkala Unsur?
*Which of the following statements is **correct** about the changes in properties of elements across Period 3 in the Periodic Table of Element?*

- A Jejari atom semakin bertambah
The atomic radius is increasing
- B Keelektronegatifan unsur semakin berkurang
The electronegativity of the elements is decreasing
- C Daya tarikan nukleus terhadap elektron semakin bertambah
Nucleus attraction force of the electron is increasing
- D Sifat oksida berubah daripada oksida asid kepada amfoterik kepada oksida bes
The properties of oxide change from acidic oxides to amphoteric to base oxides

4. Antara berikut, yang manakah unsur?
Which of the following is an element?

- | | |
|-----------------------------------|-----------------------------|
| A Ammonia
<i>Ammonia</i> | C Butanol
<i>Butanol</i> |
| B Naftalena
<i>Naphthalene</i> | D Oksigen
<i>Oxygen</i> |

5. Apakah nama bagi Kumpulan 1 dalam Jadual Berkala Unsur?
What is the name of Group 1 of the Periodic Table of Elements?

- | | |
|---|---------------------------------|
| A Logam Alkali Bumi
<i>Alkaline Earth Metals</i> | C Halogen
<i>Halogen</i> |
| B Logam Alkali
<i>Alkaline Metals</i> | D Gas Adi
<i>Noble Gases</i> |

6. Antara berikut yang manakah merupakan polimer sintetik?
Which of the following is a synthetic polymer?

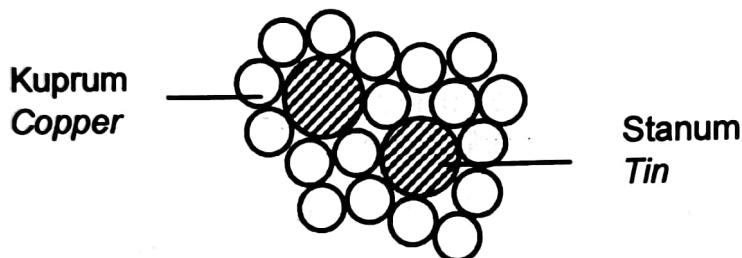
- | | |
|-----------------------------|-----------------------------------|
| A Tiokol
<i>Thiokol</i> | C Asid amino
<i>Amino acid</i> |
| B Glukosa
<i>Glucose</i> | D Getah
<i>Rubber</i> |

7. Apakah bahan yang terhasil apabila etanol terbakar dalam oksigen berlebihan?

What substance is produced when ethanol burns in excess oxygen?

- A Karbon dioksida dan karbon monoksida
Carbon dioxide and carbon monoxide
- B Karbon dioksida dan air
Carbon dioxide and water
- C Karbon dioksida, karbon monoksida dan air
Carbon dioxide, carbon monoxide and water

8. Rajah 2 menunjukkan susunan zarah dalam suatu aloi.
Diagram 2 shows the arrangement of particles in an alloy.



Rajah 2 / Diagram 2

Apakah aloi yang ditunjukkan dalam Rajah 2?
What is the alloy shown in Diagram 2?

- | | |
|---------------------------|---------------------------------|
| A Keluli
<i>Steel</i> | C Loyang
<i>Brass</i> |
| B Gangsa
<i>Bronze</i> | D Duralumin
<i>Duralumin</i> |

- Diagram 3 shows the medicine label supplied by the doctor to Mr. Ahmad.**



Based on the instruction given on the medicine envelope, what type of medicine was given to Mr. Ahmad?

- | | | | |
|----------|--|----------|---|
| A | Antimikrob
<i>Antimicrobials</i> | C | Analgesik
<i>Analgesics</i> |
| B | Antialergi
<i>Anti allergies</i> | D | Kortikosteroid
<i>Corticosteroids</i> |

- Which of the following substance is a liquid at 100 °C?**

	Bahan <i>Substance</i>	Takat lebur (°C) <i>Melting point (°C)</i>	Takat didih (°C) <i>Boiling point (°C)</i>
A	P	-157	-9
B	Q	-13	55
C	R	80	196
D	S	110	200

11. Antara berikut, yang manakah alkali lemah?
Which of the following is a weak alkali?

A Larutan natrium hidroksida
Sodium hydroxide solution

B Larutan kalium hidroksida
Potassium hydroxide solution

C Larutan kalsium hidroksida
Calcium hydroxide solution

D Larutan ammonia
Ammonia solution

12. Hidrokarbon tak tepu boleh ditukarkan kepada hidrokarbon tepu melalui tindak balas penambahan hidrogen dengan menggunakan bahan X sebagai mangkin. Apakah bahan X?

Unsaturated hydrocarbons can be converted to saturated hydrocarbons through a hydrogen addition reaction using substance X as a catalyst. What is substance X?

A Ferum
Iron

B Nikel
Nickel

C Mangan(IV) oksida
Manganese(IV) oxide

D Asid fosforik
Phosphoric acid

13. Jadual 1 menunjukkan maklumat bagi isotop atom-atom magnesium.
Table 1 shows information for isotopes of magnesium atoms.

Isotop <i>Isotope</i>	Nombor proton <i>Proton number</i>	Jisim atom relatif <i>Relative atomic mass</i>	Kelimpahan semulajadi, % <i>Natural abundance, %</i>
Mg-24	12	24	79
Mg-x	12	X	11
Mg-25	12	25	10

Jadual 1 / Table 1

Apakah nilai X?

[Jisim atom relatif Mg = 24]

What is the value of X?

[Relative atomic mass Mg = 24]

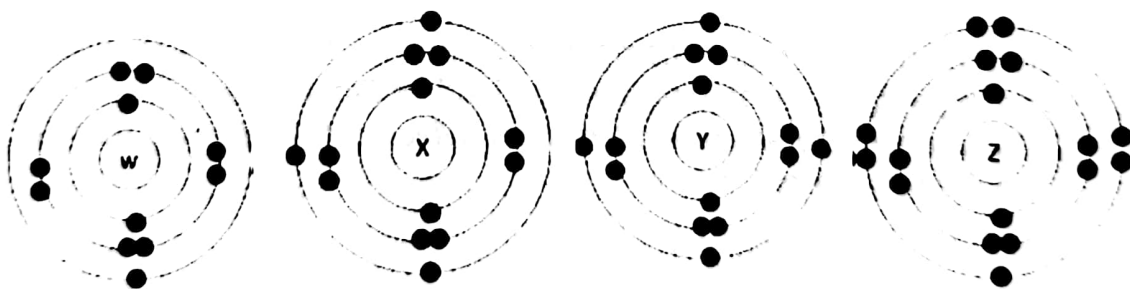
A 22.1

C 24.1

B 23.1

D 25.1

14. Rajah 4 menunjukkan susunan elektron bagi atom-atom W, X, Y dan Z. W, X, Y dan Z adalah bukan simbol sebenar bagi unsur-unsur tersebut.
Diagram 4 shows the electrons arrangements of atoms W, X, Y and Z. W, X, Y and Z are not the actual symbols of the elements.



Rajah 4 / Diagram 4

Pasangan unsur-unsur manakah yang membentuk suatu sebatian yang tak larut dalam air?

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

A W dan Z
W and Z

C W dan Y
W and Y

B X dan Z
X and Z

D Y dan Z
Y and Z

15. Apakah siri homolog bagi lemak?
What is the homologous series for fat?

A	Alkena <i>Alkene</i>	C	Ester <i>Ester</i>
B	Asid karboksilik <i>Carboxylic acid</i>	D	Alkohol <i>Alcohol</i>

16. Tindak balas redoks adalah tindak balas kimia yang melibatkan pengoksidaan dan penurunan yang berlaku secara serentak. Antara berikut yang manakah berlaku dalam tindak balas pengoksidaan?
Redox reaction is a chemical reaction that involves oxidation and reduction reaction occurring at the same time. Which of the following occurs in oxidation reaction?

A Menerima hidrogen
Gain hydrogen

B Kehilangan oksigen
Loss oxygen

C Kehilangan elektron
Loss electron

D Pengurangan nombor pengoksidaan
Oxidation number reduction

17. Silika digunakan untuk membuat semua jenis kaca. Antara jenis kaca di bawah yang manakah diperbuat daripada silika sahaja?
Silica is used to make all kind of glass. Which of the following types of glass is made of silica only?

A Kaca silika terlakur
Fused silica glass

B Kaca soda kapur
Soda-lime glass

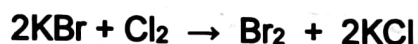
C Kaca borosilikat
Borosilicate glass

D Kaca plumbum
Lead crystal glass

18. 1 mol natrium dan 1 mol neon mempunyai
[Jisim atom relatif Ne = 20, Na = 23]
1 mole of sodium and 1 mole of neon have
[Relative atomic mass : Ne = 20, Na = 23]

- A Jisim yang sama
The sama mass
- B Bilangan atom yang sama
The same number of atoms
- C Bilangan molekul yang sama
The same number of molecule
- D Bilangan elektron yang sama
The same number of electrons

19. Tindak balas antara larutan kalium bromide dan air klorin adalah seperti persamaan di bawah.
The following is the reaction between potassium bromide solution and chlorine water.



Apakah perubahan nombor pengoksidaan bagi klorin dalam tindak balas ini?
Which of the following shows the changing of oxidation number of chlorine in this reaction?

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

20. Kehidupan seharian kita dilalui dengan pelbagai tindak balas kimia. Berdasarkan tindak balas di bawah, yang manakah tindak balas endotermik?
In our everyday life we come across with variety chemical of reactions. According to the reaction below, which reaction is explain about endothermic reaction?

- A Tindak balas peneutralan
Neutralisation reaction
- B Pembakaran bahan api
Combustion of fire crackers
- C Respirasi
Respiration
- D Fotosintesis
Photosynthesis

21. Atom Y mengandungi 12 proton, 15 neutron dan 12 elektron. Apakah nombor nukleon atom Y?
Atom Y contains 12 protons, 15 neutrons and 12 electrons. What is the nucleon number of atom Y?

- | | | | |
|---|----|---|----|
| A | 12 | C | 27 |
| B | 24 | D | 39 |

22. Berikut ialah pemerhatian apabila garam Y di panaskan.
The following are the observations when salt Y is heated.

- Gas terbebas mengeruhkan air kapur
Gas released turns lime water chalky
- Baki berwarna hitam
Residue is black in colour

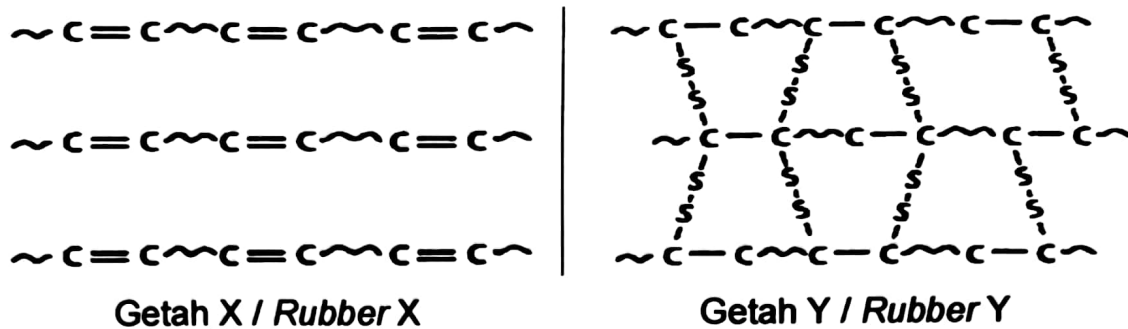
Apakah gas dan baki daripada pemanasan tersebut?
What are the gas and residue from the heating?

	Gas / Gas	Baki / Residue
A	Karbon dioksida <i>Carbon dioxide</i>	Kuprum(II) oksida <i>Copper(II) oxide</i>
B	Karbon dioksida <i>Carbon dioxide</i>	Kuprum(II) karbonat <i>Copper(II) carbonate</i>
C	Oksigen <i>Oxygen</i>	Plumbum(II) oksida <i>Lead(II) oxide</i>
D	Oksigen <i>Oxygen</i>	Zink oksida <i>Zinc oxide</i>

23. Apakah kala untuk unsur dengan nombor proton 20?
What is the period for an element with a proton number of 20?

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

24.



Rajah 4 / Diagram 4

Rajah 4 menunjukkan dua jenis getah. Pernyataan manakah paling baik menerangkan mengapa getah Y lebih elastik daripada getah X?

Figure 4 shows two types of rubber. Which statement best explains why rubber Y is more elastic than rubber X?

- A Getah Y lebih besar daripada getah X
Rubber Y is bigger than rubber X
- B Getah Y lebih mudah dioksidakan daripada getah X.
Rubber Y is more easily oxidized than rubber X.
- C Takat lebur dan takat didih getah Y lebih tinggi berbanding getah X.
The melting point and boiling point of rubber Y is higher than rubber X.
- D Kehadiran rantai sulfur menarik molekul getah Y kembali kepada kedudukan asal.
The presence of sulfur cross-chains pulls the Y rubber molecule back to its original position.

25. Antara bahan berikut, yang manakah sifat elektrolit?

Which of the following substances is an electrolyte?

- A Elektrolit boleh mengalirkan haba dalam keadaan akueus sahaja
Electrolytes can conduct heat only in an aqueous state
- B Elektrolit boleh mengalirkan arus elektrik dalam keadaan leburan dan larutan akueus.
Electrolytes can conduct electric current in molten state and aqueous solution.
- C Elektrolit boleh mengalirkan haba dalam keadaan leburan sahaja
Electrolytes can conduct heat only in the molten state
- D Elektrolit boleh mengalirkan arus elektrik dalam keadaan cecair sahaja.
Electrolytes can conduct electric current only in liquid state.

26. Paku besi yang manakah berkarat paling cepat?
Which iron nails rust the fastest?

A



Larutan agar-agar + larutan kalium heksasianoferat(III)
+ larutan fenolftalein
Agar solution + potassium hexacyanoferrate(III) + Phenolphthalein solution

Paku besi dililit dengan stanum
Iron nail coiled with tin

B



Larutan agar-agar + larutan kalium heksasianoferat(III)
+ larutan fenolftalein
Agar solution + potassium hexacyanoferrate(III) + Phenolphthalein solution

Paku besi dililit dengan zink
Iron nail coiled with zinc

C



Larutan agar-agar + larutan kalium heksasianoferat(III)
+ larutan fenolftalein
Agar solution + potassium hexacyanoferrate(III) + Phenolphthalein solution

Paku besi dililit dengan plumbum
Iron nail coiled with lead

D



Larutan agar-agar + larutan kalium heksasianoferat(III)
+ larutan fenolftalein
Agar solution + potassium hexacyanoferrate(III) + Phenolphthalein solution

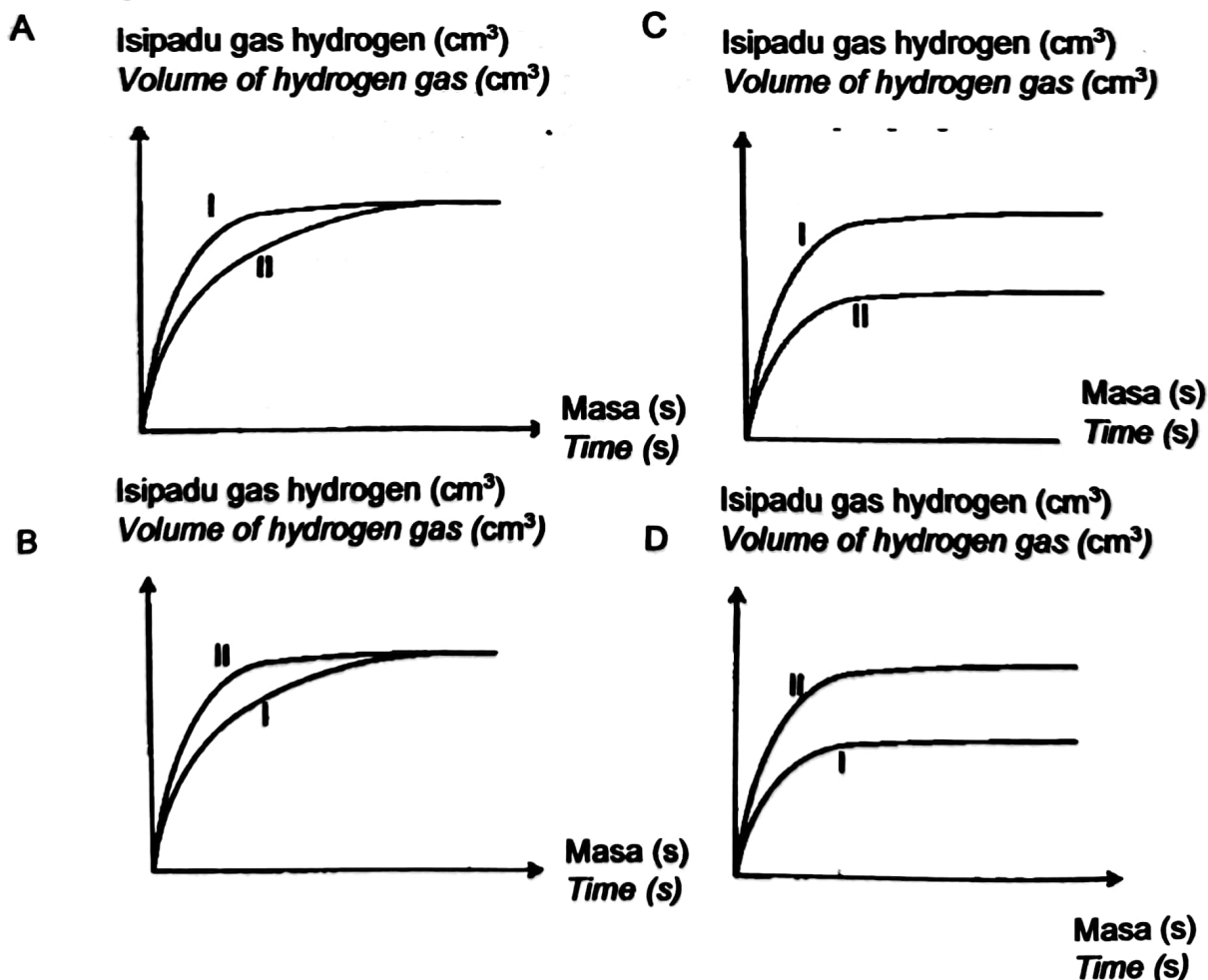
Paku besi dililit dengan kuprum
Iron nail coiled with copper

27. Dua set eksperimen telah dijalankan untuk mengkaji satu faktor yang mempengaruhi kadar tindak balas. Jadual di bawah menunjukkan bahan tindak balas yang digunakan dalam kedua-dua eksperimen tersebut.

Two sets of experiments were conducted to examine a factor that affects the rate of reaction. The table below shows the reagents used in both experiments.

Set	I	II
Bahan tindak balas Reactants	20 cm ³ asid sulfurik 0.5 mol dm ⁻³ + serbuk zink berlebihan 20 cm ³ of 0.5 mol dm ⁻³ sulphuric acid + excess zinc powder	20 cm ³ asid sulfurik 0.5 mol dm ⁻³ + ketulan zink berlebihan 20 cm ³ of 0.5 mol dm ⁻³ sulphuric acid + excess zinc granules

Graf manakah yang menunjukkan lengkung yang betul bagi Set I dan Set II?
Which graph shows the correct curves for Set I and Set II?



28. Antara berikut yang manakah kegunaan kobalt-60?

Which of the following is the use of cobalt-60?

- A Menganggar usia fosil
Estimating the age of fossils
- B Mengkaji metabolisme tumbuhan
Studying plant metabolism
- C Mensterilkan alat pembedahan
Sterilize surgical instruments
- D Merawat penyakit tiroid
Treating thyroid disease

29. Antara berikut, yang manakah benar tentang sifat oksida unsur apabila merentasi kala 3?

Which of the following is true about the oxide properties of elements when crossing the period 3?

- A Na_2O merupakan oksida bes
 Na_2O is a base oxide
- B Al_2O_3 merupakan oksida asid
 Al_2O_3 is an acid oxide
- C SiO_2 merupakan oksida bes
 SiO_2 is a base oxide
- D MgO merupakan oksida asid
 MgO is an acidic oxide

30. Ion natrium dan atom natrium mempunyai bilangan zarah subatom yang berbeza. Antara berikut, yang manakah betul mengenai ion natrium berbanding atom natrium?

Sodium ions and sodium atoms have different numbers of subatomic particles. Which of the following is true about sodium ions versus sodium atoms?

- A Bilangan neutron yang lebih
More number of neutrons
- B Bilangan elektron yang kurang
Less number of electrons
- C Nombor proton yang lebih besar
Larger proton number
- D Nombor nukleon yang lebih kecil
Smaller nucleon number

31. Antara berikut, manakah garam yang larut dalam air?
Which of the following salts dissolves in water?

- A Barium sulfat
Barium sulphate
- B Argentum karbonat
Silver carbonate
- C Plumbum(II) klorida
Lead(II) chloride
- D Kalium nitrat
Potassium nitrate

32. Air yang mengandungi ion kalsium, Ca^{2+} dan ion X^{2+} , disebut air liat. Anion sabun bergabung dengan kation-kation tersebut untuk membentuk garam yang tidak larut di dalam air, iaitu kekat.

Antara formula kimia berikut, manakah yang menunjukkan formula kimia bagi kekat untuk ion X^{2+} selepas bertindak balas dengan natrium laurat?

Water that contains calcium ions, Ca^{2+} and ions, X^{2+} is called hard water. The soap anions combine with the cations to form a salt that does not dissolve in water, which is a scum.

Which of the following chemical formulas shows the chemical formula of the bond for the X^{2+} ion after reacting with sodium laurate?

- | | | | |
|---|--|---|--|
| A | $(\text{CH}_3(\text{CH}_2)_{10}\text{COO})_2\text{Ba}$ | C | $(\text{CH}_3(\text{CH}_2)_{14}\text{COO})_2\text{Ba}$ |
| B | $(\text{CH}_3(\text{CH}_2)_{10}\text{COO})_2\text{Mg}$ | D | $(\text{CH}_3(\text{CH}_2)_{14}\text{COO})_2\text{Mg}$ |

33. Antara sebatian berikut yang manakah mengandungi 2.4 dm^3 isipadu gas pada suhu dan tekanan bilik?

[Jisim atom relatif : $\text{H}=1$, $\text{C}=12$, $\text{O}=16$, $\text{N}=14$ dan 1 mol gas menempati isipadu sebanyak 24 dm^3 pada suhu dan tekanan bilik]

Which of the following compounds contains 24 dm^3 volume of gas at room temperature and pressure?

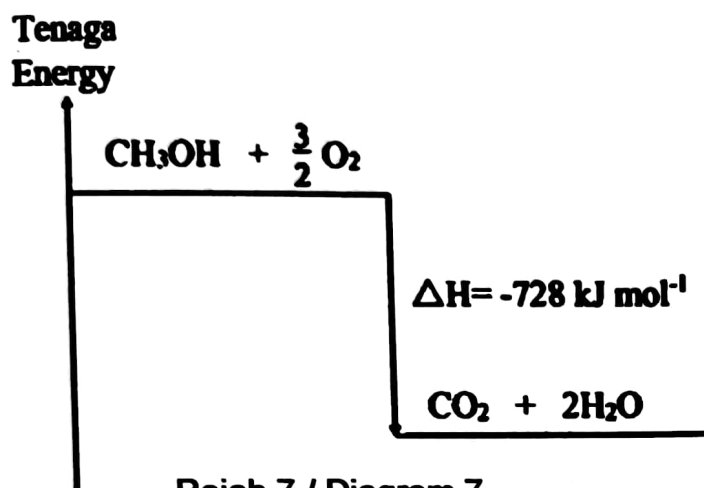
[Relative atomic mass : $\text{H}=1$, $\text{C}=12$, $\text{O}=16$, $\text{N}=14$ and 1 mole of gas occupies a volume of 24 dm^3 at room temperature and pressure]

- | | | | |
|-----|------------------------|---|--------------------------|
| I | 0.8 g CH_4 | | |
| II | 1.7 g NH_3 | | |
| III | 2.2 g CO_2 | | |
| IV | 4.6 g NO_2 | | |
| A | I dan II
I and II | C | II dan IV
II and IV |
| B | I dan III
I and III | D | III dan IV
III and IV |

Rajah 5 / Diagram 5

36. Rajah 7 menunjukkan gambarajah aras tenaga bagi pembakaran methanol, CH_3OH .

Figure 7 shows the energy level diagram for methanol combustion, CH_3OH .



Berapakah jisim metanol yang diperlukan untuk menaikkan suhu 200 cm^3 air sebanyak 30.5°C ?

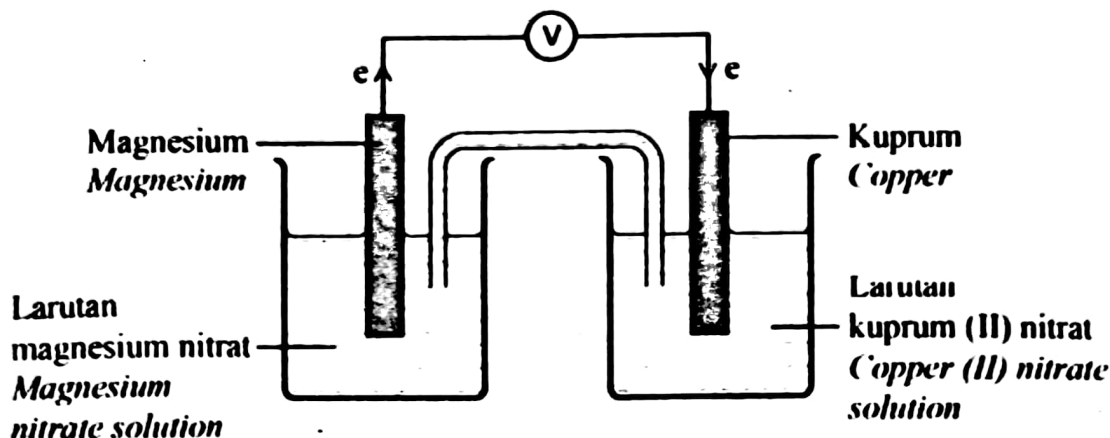
What mass of methanol is required to raise the temperature of 200 cm^3 of water by 30.5°C ?

[Jisim molar metanol = 32, muatan haba tentu air = $4.2 \text{ Jg}^{-1}\text{C}^{-1}$, ketumpatan air = 1 g cm^{-3}].

[Molar mass of methanol = 32, specific heat capacity of water = $4.2 \text{ Jg}^{-1}\text{C}^{-1}$, density of water = 1 g cm^{-3}].

- | | | | |
|---|--------|---|--------|
| A | 1.12 g | C | 2.84 g |
| B | 2.24 g | D | 3.52 g |

37. Rajah 8 menunjukkan satu sel kimia dan notasi sel.
Figure 8 shows a chemical cell and cell notation.



Notasi Sel
Cell Notation



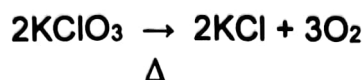
Rajah 8 / Diagram 8

Antara berikut, manakah benar?

Which of the following is true?

- A Atom magnesium bertindak sebagai agen pengoksidaan.
Magnesium atoms act as oxidizing agents.
- B Jisim elektrod magnesium semakin bertambah
The mass of the magnesium electrode is increasing
- C Ion kuprum(II) diturunkan kepada atom kuprum.
Copper(II) ions are reduced to copper atoms.
- D Jisim elektrod kuprum semakin berkurang
The mass of the copper electrode is decreasing

38. Persamaan berikut menunjukkan proses penguraian kalium klorat(V).
The following equation shows the decomposition process of potassium chlorate(V).



Apakah jisim kalium klorat(V) yang diperlukan untuk menghasilkan 2.0 mol gas oksigen?

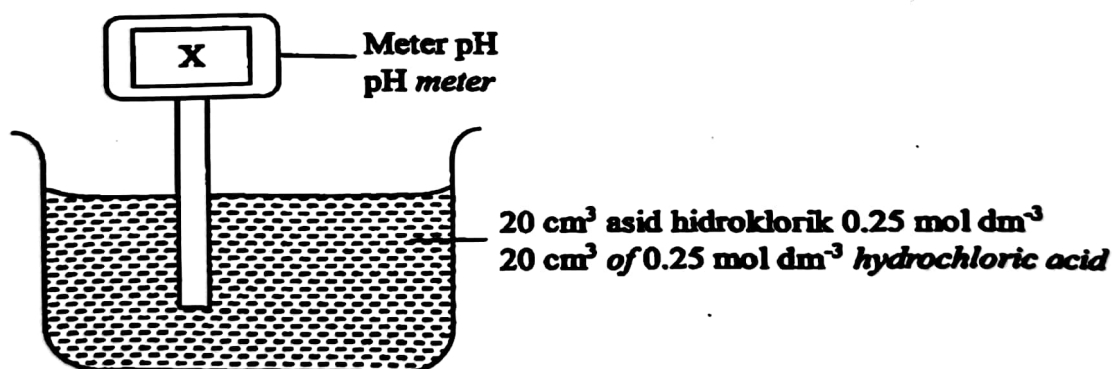
What mass of potassium chlorate(V) is required to produce 2.0 moles of oxygen gas?

[Jisim atom relatif : O=16, Cl=35.5, K=39]

[Relative atomic mass : O=16, Cl=35.5, K=39]

- | | | | |
|---|----------|---|----------|
| A | 162.93 g | C | 325.85 g |
| B | 245.00 g | D | 490.00 g |

39. Rajah 9 menunjukkan susunan radas untuk mengukur nilai pH asid.
Figure 9 shows the arrangement of the apparatus to measure the pH value of the acid.

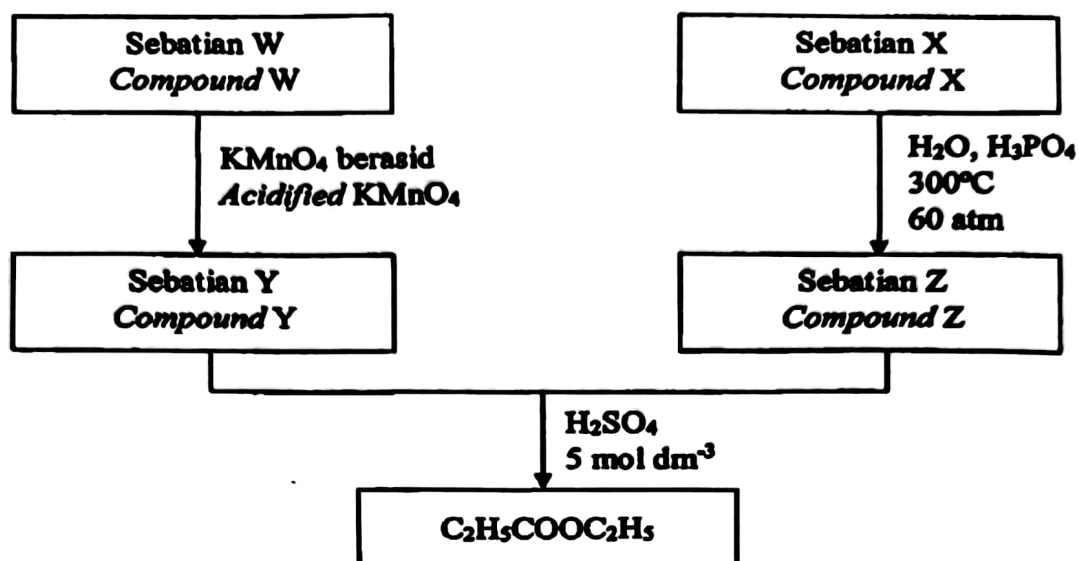


Rajah 9 / Diagram 9

Apakah nilai X?
What is the value of X?

- | | | | |
|---|------|---|------|
| A | 0.30 | C | 1.15 |
| B | 0.60 | D | 2.30 |

40. Rajah 10 menunjukkan siri tindak balas bagi sebatian karbon W, X, Y dan Z.
Figure 10 shows the reaction series for carbon compounds W, X, Y and Z.



Rajah 10 / Diagram 10

Antara yang berikut, sebatian manakah yang akan menghasilkan nyalaan biru apabila bertindak balas dengan gas oksigen berlebihan?

Which of the following compounds will produce a blue flame when reacted with excess oxygen gas?

I W

II X

III Y

IV Z

A I dan II
 I and II

C II dan III
 II and III

B I dan IV
 I and IV

D III dan IV
 III and IV

KERTAS PEPERIKSAAN TAMAT

SULIT

PERCUBAAN SPM YIK KIMIA K1