

4541/1
Kimia
Kertas 1
2024
1 ¼ jam



MODUL GEMILANG SPM 2024

KIMIA

Kertas 1

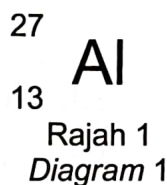
Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini dalam dwibahasa.*
2. *Soalan adalah dalam bahasa Melayu mendahului soalan yang sepadan dalam bahasa Inggeris.*
3. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*
4. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

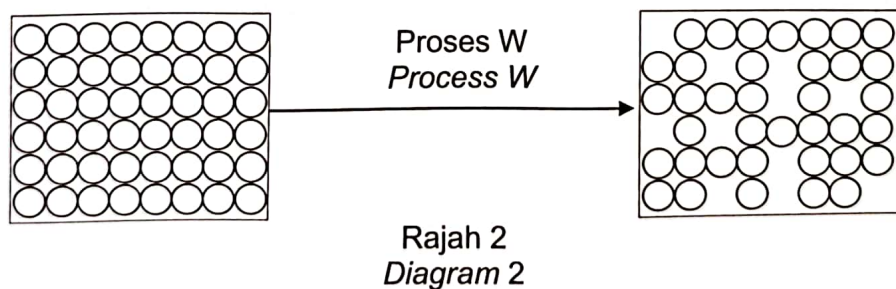
Kertas soalan ini mengandungi 22 halaman bercetak

- 1 Antara bahan berikut, yang manakah mengandungi ion?
Which of the following substance consists of ions?
- A Argon
Argon
 - B Kuprum
Copper
 - C Karbon dioksida
Carbon dioxide
 - D Natrium klorida
Sodium chloride
- 2 Rajah 1 menunjukkan perwakilan piawai bagi atom aluminium.
Diagram 1 shows the standard representation of aluminium atom.



Apakah bilangan elektron valens bagi atom tersebut?
What is the number of valence electrons of the atom?

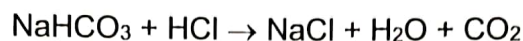
- A 3
 - B 7
 - C 13
 - D 14
- 3 Rajah 2 menunjukkan susunan zarah bagi pertukaran keadaan jirim.
Diagram 2 shows the particles arrangement for the change of state of matter.



Antara berikut yang manakah adalah proses W?
Which of the following is process W?

- A Pemejalwapan
Sublimation
- B Kondensasi
Condensation
- C Penyejatan
Evaporation
- D Peleburan
Melting

- 4 Persamaan kimia berikut mewakili satu tindak balas.
The following chemical equation represents a reaction.



Apakah bahan tindak balas dalam persamaan ini?
What are the reactants in this equation?

- A Natrium hidrogen karbonat dan asid hidroklorik
Sodium hydrogen carbonate and hydrochloric acid
- B Natrium hidrogen karbonat dan natrium klorida
Sodium hydrogen carbonate and sodium chloride
- C Natrium klorida, air dan karbon dioksida
Sodium chloride, water and carbon dioxide
- D Natrium karbonat dan asid hidroklorik
Sodium carbonate and hydrochloric acid
- 5 Jadual 1 menunjukkan unsur-unsur dengan nombor proton masing-masing.
Table 1 shows elements with their respective proton number.

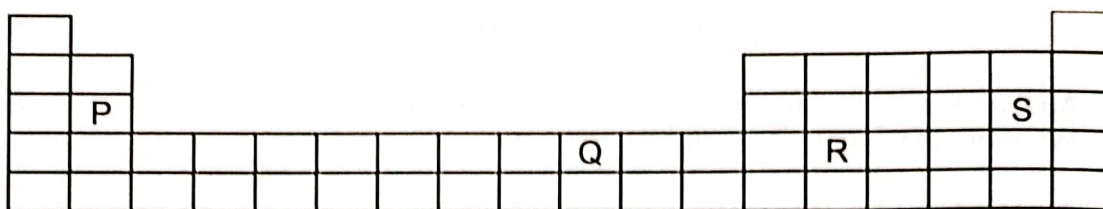
Unsur <i>Element</i>	Nombor proton <i>Proton number</i>
W	9
X	11
Y	19
Z	20

Jadual 1
Table 1

Pasangan unsur manakah yang mempunyai sifat kimia yang sama?
Which pair of elements has the same chemical properties?

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

- 6** Rajah 3 menunjukkan empat unsur dalam Jadual Berkala Unsur.
Diagram 3 shows four elements in the Periodic Table of Elements.



Rajah 3
Diagram 3

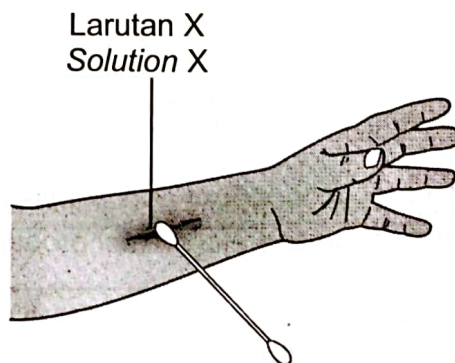
Antara unsur berikut, yang manakah boleh digunakan sebagai mangkin dalam suatu tindak balas kimia?

Which of the following element can be used as a catalyst in a chemical reaction?

- | | |
|---|---|
| A | P |
| B | Q |
| C | R |
| D | S |

- 7 Rajah 4 menunjukkan seorang murid menyapu larutan X pada lukanya untuk membunuh bakteria.

Diagram 4 shows a student applying solution X to his wound to kill bacteria.



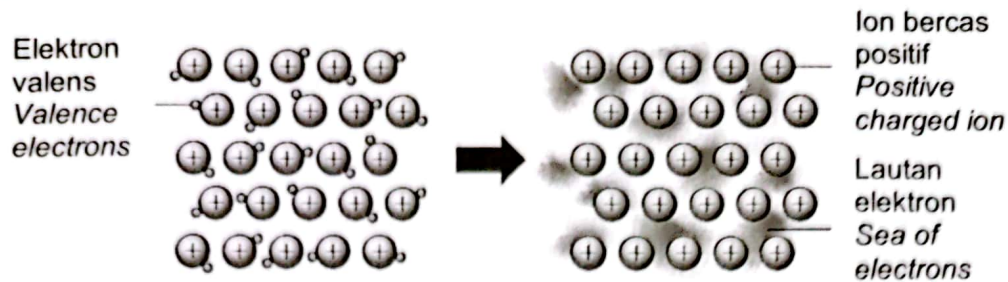
Rajah 4
Diagram 4

Antara unsur Kumpulan 17 berikut, yang manakah paling sesuai digunakan untuk membuat larutan X?

Which of the following Group 17 element is the most suitable to be used to make solution X?

- A** Fluorin
Fluorine
- B** Klorin
Chlorine
- C** Bromin
Bromine
- D** Iodin
Iodine

- 8 Rajah 5 menunjukkan sejenis ikatan.
Diagram 5 shows a type of bond.



Rajah 5
Diagram 5

Apakah nama ikatan tersebut?
What is the name of the bond?

- A Ikatan ion
Ionic bond
- B Ikatan kovalen
Covalent bond
- C Ikatan logam
Metal bond
- D Ikatan datif
Dative bond
- 9 Antara pernyataan berikut, yang manakah betul tentang pembentukan ikatan datif?
Which of the following statement about the formation of a dative bond is correct?
- A Ammonia apabila larut dalam air tidak boleh membentuk ikatan datif
Ammonia when dissolved in water cannot form a dative bond
- B Sepasang elektron yang dikongsi berasal daripada satu atom sahaja
A pair of electrons shared are from one atom only
- C Dikenali juga sebagai ikatan logam
It is also known as a metallic bond
- D Merupakan sejenis ikatan ion
It is a type of ionic bond
- 10 Antara yang berikut, yang manakah merupakan garam terlarut?
Which of the following is a soluble salt?
- A Argentum klorida
Silver chloride
- B Plumbum(II) klorida
Lead(II) chloride
- C Natrium sulfat
Sodium sulphate
- D Barium sulfat
Barium sulphate

- 11 Apakah komponen utama dalam gangsa?

What is the main component in bronze?

- A Ferum
Iron
- B Aluminium
Aluminium
- C Stanum
Tin
- D Kuprum
Copper

- 12 Radas kaca makmal adalah sejenis kaca borosilikat.

Manakah antara bahan berikut yang digunakan untuk menghasilkan radas kaca makmal?

Laboratory glass wares are a type of borosilicate glass.

Which of the following materials is used to produce laboratory glass wares?

- I Boron oksida
Boron oxide
- II Kalsium karbonat
Calcium carbonate
- III Lead(II) oxide
Plumbum(II) oksida
- IV Natrium karbonat
Sodium carbonate

- 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

- 13 Antara bahan berikut yang manakah merupakan agen pengoksidaan?

Which of the following substance is an oxidising agent?

- A Air klorin
Chlorine water
- B Kalium iodida
Potassium iodide
- C Serbuk zink
Zinc powder
- D Ferum(II) sulfat
Iron(II) sulphate

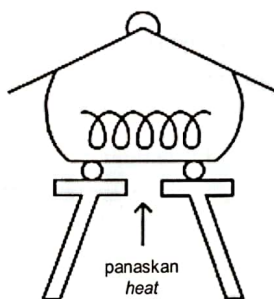
14 Apakah maksud agen penurunan?

What is the meaning of a reducing agent?

- A Bahan yang mengoksidakan bahan lain tetapi ianya sendiri terturun
Substance that oxidises other substances but itself is reduced
- B Bahan yang menurunkan bahan lain tetapi ianya sendiri teroksida
Substance that reduces other substances but itself is oxidised
- C Bahan yang mengalami pengoksidaan
Substance that undergoes oxidation
- D Bahan yang mengalami penurunan
Substance that undergoes reduction

15 Rajah 6 menunjukkan susunan radas untuk menentukan formula empirik bagi suatu logam oksida.

Diagram 6 shows the apparatus set-up to determine the empirical formula of a metal oxide.



Rajah 6
Diagram 6

Antara yang berikut, bagi logam manakah kaedah ini boleh digunakan untuk menentukan formula empirik oksida logamnya?

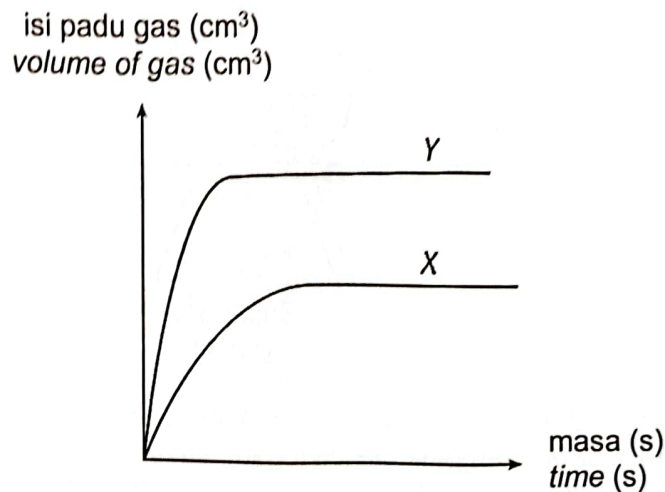
Which of the following metal can this method be used to determine its oxide's empirical formula?

- A Stanum
Tin
- B Ferum
Iron
- C Magnesium
Magnesium
- D Kuprum
Copper

- 16 Antara yang berikut, manakah betul tentang polietena?
Which of the following is true about polyethene?

A Termoset
Thermoset
B Termoplastik
Thermoplastic
C Elastomer
Elastomer
D Semulajadi
Natural

- 17 Rajah 7 menunjukkan graf isi padu gas melawan masa bagi tindak balas antara zink dengan asid hidroklorik.
Diagram 7 shows a graph of volume of gas against time for the reaction between zinc and hydrochloric acid.



Rajah 7
Diagram 7

Lengkung X diperoleh apabila ketulan zink berlebihan bertindak balas dengan 25 cm³ asid hidroklorik 1 mol dm⁻³ pada suhu bilik.

Antara yang berikut, yang manakah perlu dilakukan untuk menghasilkan lengkung Y?

Curve X is obtained when excess zinc granules react with 25 cm³ of 1 mol dm⁻³ of hydrochloric acid at room temperature.

Which of the following should be done to produce curve Y?

- A Menggantikan ketulan zink dengan serbuk zink
Replace the zinc granules with zinc powder
B Menambahkan beberapa titis larutan kuprum(II) sulfat
Add a few drops of copper(II) sulphate solution
C Menggunakan 25 cm³ asid sulfurik 1 mol dm⁻³
Use 25 cm³ of 1 mol dm⁻³ sulphuric acid
D Meningkatkan suhu eksperimen kepada 50°C
Increase the temperature of the experiment to 50°C

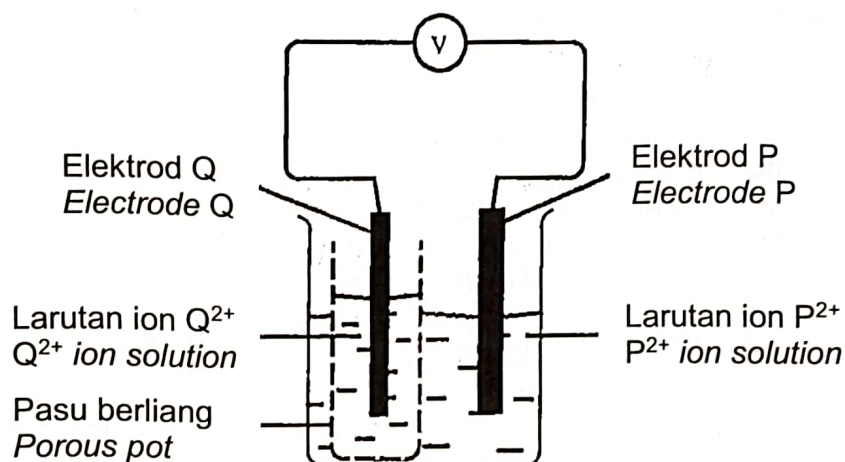
- 18 Mengapakah seramik sesuai digunakan sebagai komponen enjin di dalam kapal terbang jet?

Why ceramic is suitable to be used as engine components in jet plane?

- A Keras dan kuat
Hard and strong
- B Ketumpatan yang tinggi
High density
- C Lengai terhadap bahan kimia
Inert towards chemicals
- D Tahan terhadap suhu yang tinggi
Withstand high temperature

- 19 Rajah 8 menunjukkan susunan radas bagi satu sel kimia.

Diagram 8 shows the apparatus set-up of a chemical cell.

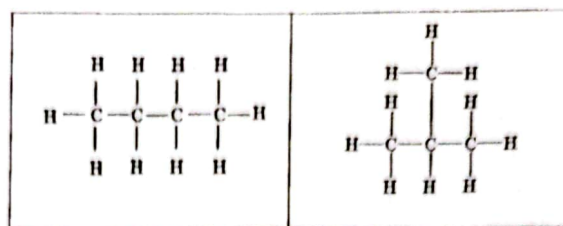


Rajah 8
Diagram 8

Elektron bergerak dari elektrod P ke elektrod Q melalui wayar penyambung.
Antara yang berikut, pernyataan manakah yang betul tentang sel kimia itu?
Electron moves from electrode P to electrode Q through the connecting wires.
Which of the following statements is correct about the chemical cell?

- A Elektrod P ialah katod
Electrode P is cathode
- B Ion Q^{2+} merupakan agen pengoksidaan
Ion Q^{2+} is an oxidising agent
- C Ion P^{2+} menerima elektron
Ion P^{2+} receives electron
- D Nombor pengoksidaan bagi P berubah dari +2 kepada 0
Oxidation number of P changes from +2 to 0

- 20 Rajah 9 menunjukkan formula struktur bagi dua sebatian hidrokarbon.
Diagram 9 shows the structural formulae of two hydrocarbon compounds.



Rajah 9
 Diagram 9

Antara yang berikut, pernyataan manakah betul tentang kedua-dua sebatian?
Which of the following statements is correct about both compounds?

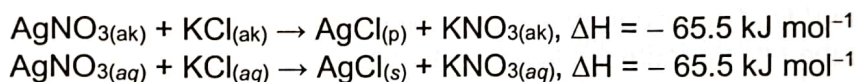
- A Menghasilkan karbon monoksida dan air dalam pembakaran tidak lengkap
Produce carbon monoxide and water in incomplete combustion
- B Kedua-dua sebatian boleh bertindak balas dengan air bromin
Both compounds can react with bromine water
- C Formula molekul sama tetapi formula empirik berbeza
Same molecular formula but different empirical formula
- D Sifat fizik sama tetapi sifat kimia berbeza
Same physical properties but different chemical properties
- 21 Formula molekul bagi suatu sebatian ialah $\text{CH}_3\text{COOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$.
 Apakah kumpulan berfungsi sebatian tersebut?
*The molecular formula of a substance is $\text{CH}_3\text{COOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$.
 What is the functional group of the substance?*
- A Hidroksil
Hydroxyl
- B Karboksilat
Carboxylate
- C Karboksil
Carboxyl
- 22 Tindak balas X menukarkan butena kepada butana.
 Apakah X?
*Reaction X changes butene to butane.
 What is X?*
- A Penapaian
Fermentation
- B Pengoksidaan
Oxidation
- C Pendehidratan
Dehydration
- D Penghidrogenan
Hydrogenation

- 23 Maklumat di bawah adalah tentang sebatian karbon X yang wujud sebagai cecair di dalam makmal kimia SMK Skudai.
The information below is about carbon compound X that exists as a liquid in the chemical laboratory of SMK Skudai.

- Boleh bertindak balas dengan larutan kalium dikromat(VI) berasid
Can react with acidic potassium dichromate(VI) solution

Apakah X?
What is X?

- A Etana
Ethane
- B Propanol
Propanol
- C Asid etanoik
Ethanoic acid
- D Etil propanoat
Ethyl propanoate
- 24 Berikut adalah persamaan termokimia bagi suatu tindak balas.
The following is a thermochemical equation for a reaction.

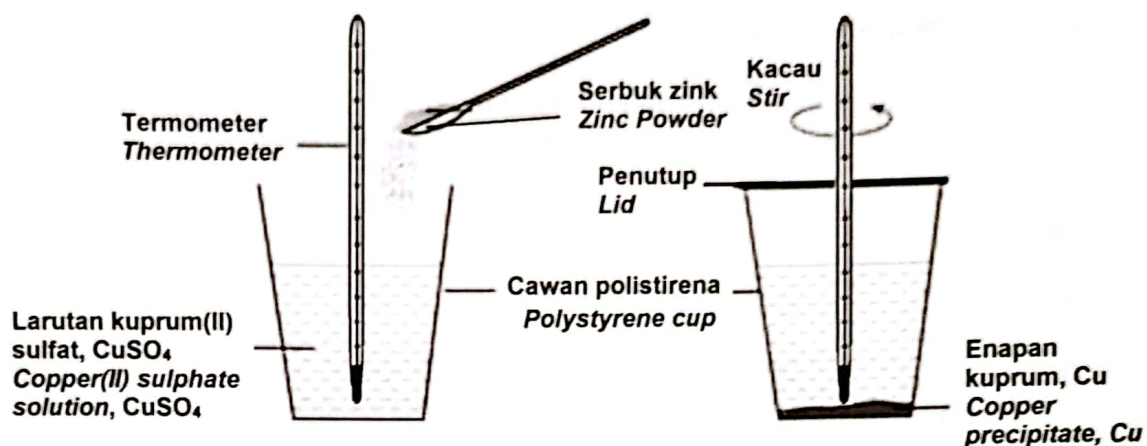


Di antara yang berikut, maklumat manakah yang betul tentang persamaan itu?
Which of the following is correct about the equation?

- A 65.5 kJ haba dibebaskan apabila 1 mol AgCl terbentuk
65.5 kJ heat is released when 1 mol AgCl is formed
- B 65.5 kJ haba diserap apabila 1 mol AgCl terbentuk
65.5 kJ heat is absorbed when 1 mol AgCl is formed
- C 65.5 kJ haba dibebaskan apabila 1 mol KNO₃ terbentuk
65.5 kJ heat is absorbed when 1 mol KNO₃ is formed
- D 65.5 kJ haba diserap apabila 1 mol KNO₃ terbentuk
65.5 kJ heat is released when 1 mol KNO₃ is formed



- 25 Rajah 10 menunjukkan suatu tindakan balas kimia.
Diagram 10 shows a chemical reaction.

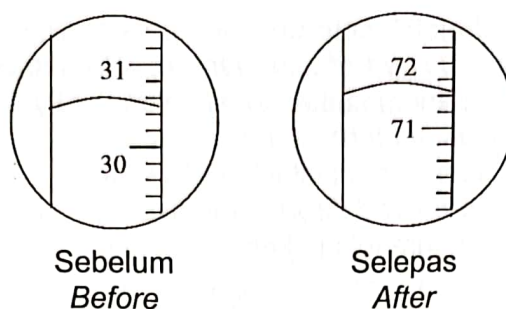


Rajah 10
Diagram 10

Antara yang berikut, pernyataan manakah benar tentang tindak balas itu?
Which of the following statements is true about the reaction?

- A Haba diserap daripada persekitaran
Heat is absorbed from the environment
- B Haba tindak balas bernilai positif
The heat of reaction has a positive value
- C Tindak balas menyebabkan suhu persekitaran meningkat
The reaction causes the surrounding temperature to rise
- D Jumlah haba bahan tindak balas lebih rendah daripada hasil tindak balas
The total heat of the reactants is lower than the products of the reaction

- 26 Rajah 11 menunjukkan bacaan termometer suatu tindak balas.
Diagram 11 shows the thermometer reading of a reaction.

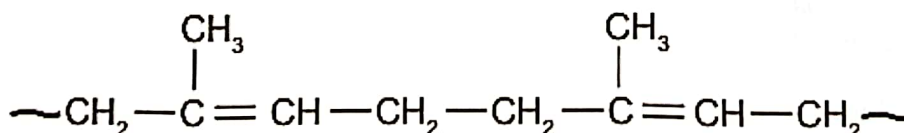


Rajah 11
Diagram 11

Antara yang berikut, manakah tindak balas yang mewakili perubahan suhu tersebut?

Which of the following reactions represents this change in temperature?

- A Ammonium klorida dilarutkan ke dalam air
Ammonium chloride is dissolved in water
 - B Tindak balas di antara asid dengan alkali
Reaction between acid and alkali
 - C Penguraian kalsium karbonat
Decomposition of calcium carbonate
 - D Tindak balas di antara asid dengan natrium bikarbonat
Reaction between acid and sodium bicarbonate
- 27 Rajah 12 menunjukkan polimer yang terdapat di dalam susu getah.
Diagram 12 shows the polymer found in latex.



Rajah 12
Diagram 12

Antara yang berikut, manakah monomer bagi polimer tersebut?
Which of the following is the monomer of the polymer?

- A 2-metilbut-1,3-diena
2-methylbut-1,3-diene
- B 3-metilbut-1,3-diena
3-methylbut-1,3-diene
- C 2-metilpent-1,3-ena
2-methylpent-1,3-ene
- D 3-metilpent-1,3-ena
3-methylpent-1,3-ene

28 Antara berikut, yang manakah betul tentang detergen?

Which of the following is correct about detergent?

- I Bahagian hidrofobik detergen larut dalam minyak
The hydrophobic part of detergent dissolves in oil
- II Detergen tidak membentuk kekat dalam air liat
Detergent does not form scum in hard water
- III Detergen disediakan melalui hidrolisis lemak dalam keadaan alkali
Detergent is prepared through the hydrolysis of fats in alkaline conditions
- IV Detergen mengurangkan kebolehan air untuk membasahi permukaan kain
Detergent reduces the ability of water to wet the surface of cloth

- 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

29 Sendi kaki seorang murid bengkak dan berasa sakit.
Apakah ubat yang sesuai diberikan kepada murid itu?

*The joint of a student's leg is swollen and painful.
What medicine is suitable to be given to the student?*

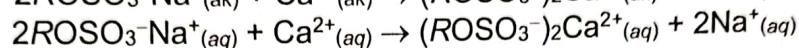
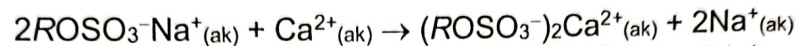
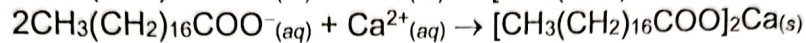
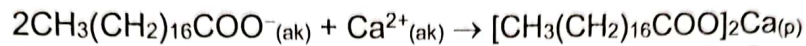
- A Klozapin
Clozapine
- B Penisilin
Penicilin
- C Barbiturat
Barbiturate
- D Parasetamol
Paracetamol

- 30 Persamaan kimia berikut menunjukkan tindak balas antara ion stearat, $\text{CH}_3(\text{CH}_2)_{16}\text{COO}^-$ dan ion alkil sulfat, ROSO_3^- dengan ion kalsium, Ca^{2+} dalam air liat.

R mewakili rantai panjang hidrokarbon.

The following chemical equation shows the reaction between stearate ions, $\text{CH}_3(\text{CH}_2)_{16}\text{COO}^-$ and alkyl sulphate ions, ROSO_3^- with calcium ions, Ca^{2+} in hard water.

R represents the hydrocarbon long chain.

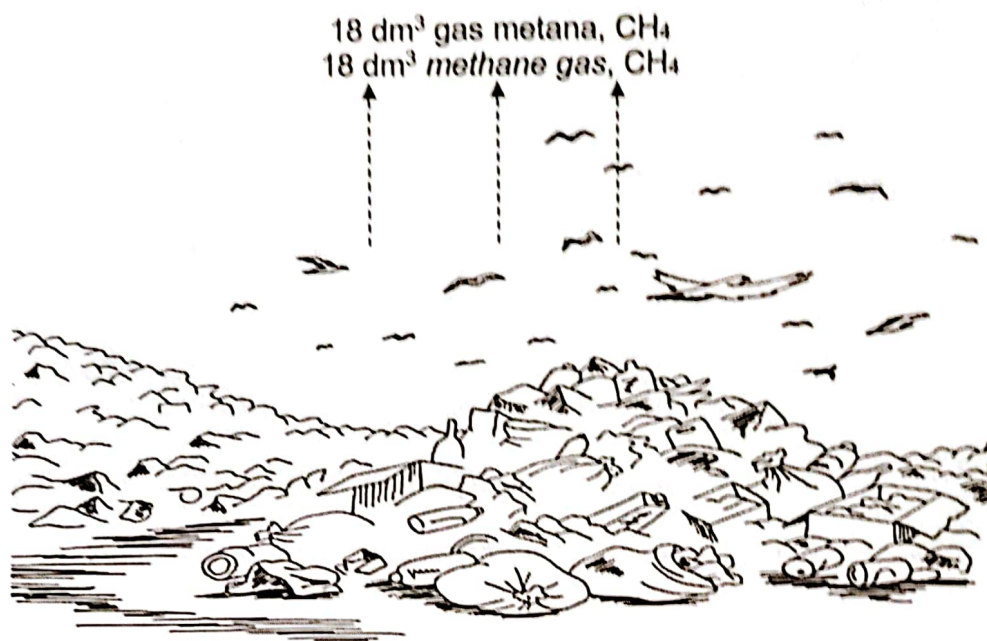


Apakah kesan penambahan ion kalsium ke atas kepekatan ion stearat atau ion alkil sulfat?

What is the effect of the addition of calcium ion on the concentration of stearate ion or alkyl sulphate ion?

- A Kepekatan ion stearat meningkat
The concentration of stearate ion increases
- B Kepekatan ion stearat berkurang
The concentration of stearate ion decreases
- C Kepekatan ion alkil sulfat meningkat
The concentration of alkyl sulphate ion increases
- D Kepekatan ion alkil sulfat berkurang
The concentration of alkyl sulphate ion decreases

- 31 Rajah 13 menunjukkan suatu kawasan pelupusan sampah.
Diagram 13 shows a waste disposal site.



Rajah 13
Diagram 13

Aktiviti mikroorganisma di kawasan itu menghasilkan gas metana.
Berapakah jisim gas metana yang terhasil?

*The activity of microorganisms in the area produces methane gas.
What is the mass of methane gas produced?*

[Jisim atom relatif : H = 1; C = 12;

Isi padu molar gas pada suhu bilik = $24 \text{ dm}^3 \text{ mol}^{-1}$]

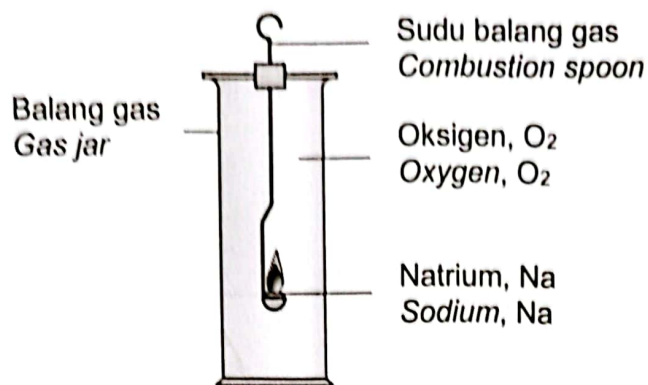
[Relative atomic mass: H = 1; C = 12;

Molar volume of gas at room temperature = $24 \text{ dm}^3 \text{ mol}^{-1}$]

- A 12 g
B 16 g
C 21 g
D 27 g
- 32 Berapakah bilangan atom dalam 0.5 mol gas ammonia, NH_3 ?
What is the number of atoms in 0.5 mol of ammonia gas, NH_3 ?
- [Pemalar Avogadro = $6.02 \times 10^{23} \text{ mol}^{-1}$]
[Avogadro constant = $6.02 \times 10^{23} \text{ mol}^{-1}$]
- A 6.02×10^{23}
B $0.5 \times 6.02 \times 10^{23}$
C $0.5 \times 3 \times 6.02 \times 10^{23}$
D $0.5 \times 4 \times 6.02 \times 10^{23}$

- 33 Rajah 14 menunjukkan satu eksperimen yang dijalankan oleh seorang murid di makmal.

Diagram 14 shows an experiment conducted by a student in the laboratory.



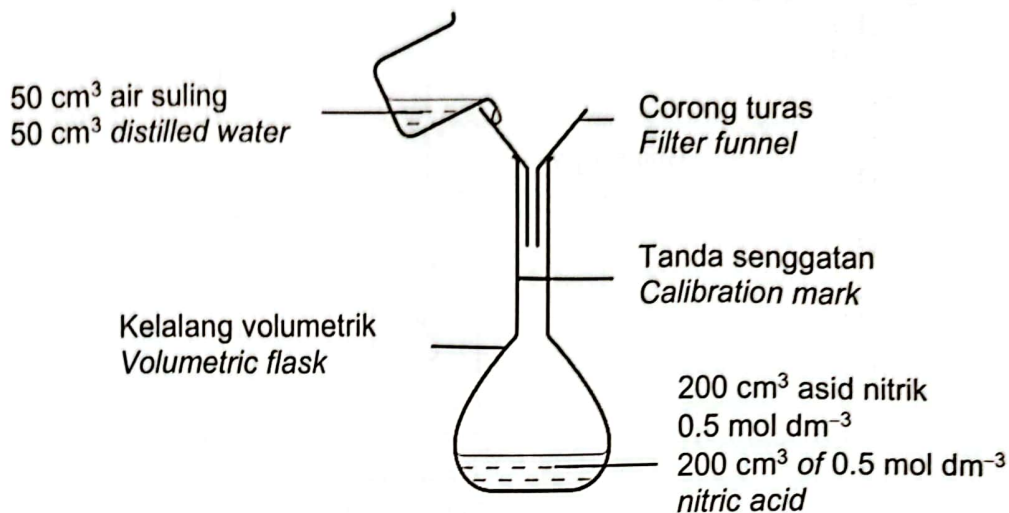
Rajah 14
Diagram 14

Persamaan kimia manakah yang mewakili tindak balas yang berlaku dalam balang gas tersebut?

Which chemical equation represents the reaction that happens in the gas jar?

- A $\text{Na} + \text{O}_2 \rightarrow \text{NaO}_2$
- B $\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$
- C $2\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$
- D $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$

- 34 Rajah 15 menunjukkan satu langkah yang diambil oleh seorang murid di makmal.
Diagram 15 shows a step taken by a student in the laboratory.



Rajah 15
Diagram 15

Apakah nilai pH akhir?
What is the final pH value?

- A 0.20
B 0.30
C 0.40
D 0.50
- 35 Larutan natrium hidroksida 0.2 mol dm⁻³ bertindak balas lengkap dengan 0.49 g asid sulfurik menghasilkan larutan natrium sulfat dan air.
Berapakah isi padu larutan natrium hidroksida yang diperlukan dalam tindak balas peneutralan ini?
[Jisim atom relatif: Na = 23; O = 16; H = 1; S = 32]

0.2 mol dm⁻³ sodium hydroxide solution reacts completely with 0.49 g sulphuric acid to produce sodium sulphate solution and water.

What is the volume of sodium hydroxide solution needed in the neutralization reaction?

[Relative atomic mass: Na = 23; O = 16; H = 1; S = 32]

- A 12.5 cm³
B 25.0 cm³
C 50.0 cm³
D 100.0 cm³

- 36 23.4 g serbuk zink lengkap bertindak balas dengan satu larutan asid hidroklorik dalam masa 2 minit.

Berapakah kadar tindak balas purata dalam mol s^{-1} ?

[Jisim atom relatif: Zn = 65]

23.4 g of zinc powder reacts completely with hydrochloric acid solution in 2 minutes.

What is the average rate of reaction in mol s^{-1} ?

[Relative atomic mass: Zn = 65]

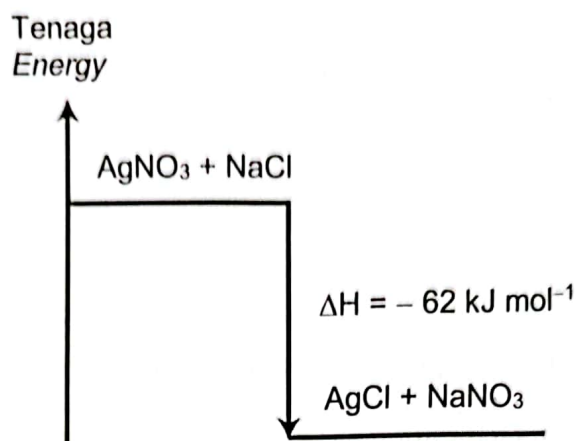
- A 0.360 mol s^{-1}
B 0.195 mol s^{-1}
C 0.180 mol s^{-1}
D 0.003 mol s^{-1}
- 37 Apakah nombor pengoksidaan bagi klorin dalam molekul-molekul dan ion-ion berikut?

What is the oxidation number of chlorine in the following molecules and ions?

	Cl_2	Cl_2O_7	ClO^-	ClO_3^-
A	0	+2	+1	+6
B	0	+7	+1	+5
C	0	+7	+2	+6
D	+7	+7	+1	+5

- 38 Rajah 16 menunjukkan rajah aras tenaga bagi menentukan haba pemendakan argentum klorida.

Diagram 16 shows the energy level diagram to determine the heat of precipitation of silver chloride.



Rajah 16
Diagram 16

Berapakah tenaga haba yang dibebaskan dan perubahan suhu campuran apabila 250 cm^3 larutan argentum nitrat 1 mol dm^{-3} ditambah kepada 250 cm^3 larutan natrium klorida 1 mol dm^{-3} di dalam cawan polistirena?

[Muatan haba tentu air = $4.2 \text{ J g}^{-1}\text{C}^{-1}$; ketumpatan air = 1.0 g cm^{-3}]

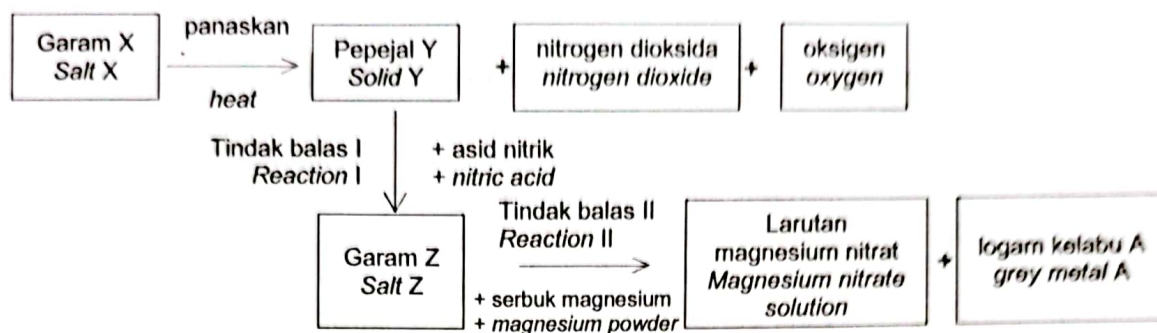
What is the heat energy released and the change in temperature of the mixture when 250 cm^3 of 1 mol dm^{-3} of silver nitrate solution is added into 250 cm^3 of 1 mol dm^{-3} of sodium chloride solution in polystyrene cup?

[Specific heat capacity of water = $4.2 \text{ J g}^{-1}\text{C}^{-1}$; density of water = 1.0 g cm^{-3}]

	Tenaga haba dibebaskan (kJ) Heat energy released (kJ)	Perubahan suhu ($^{\circ}\text{C}$) Change in temperature ($^{\circ}\text{C}$)
A	62.0	29.52
B	31.0	14.76
C	15.5	7.38
D	7.75	3.69

- 39 Rajah 17 menunjukkan satu carta alir bagi beberapa tindak balas melibatkan garam X.

Diagram 17 shows a flow chart for several reactions involving salt X.



Rajah 17
Diagram 17

Apabila garam X dipanaskan, pepejal Y yang berwarna kuning semasa sejuk terhasil.

Antara pernyataan berikut, yang manakah benar berkaitan carta alir tersebut?
When salt X is heated, solid Y which is yellow in colour when cold is produced.
Which of the following statements is true about the flow chart?

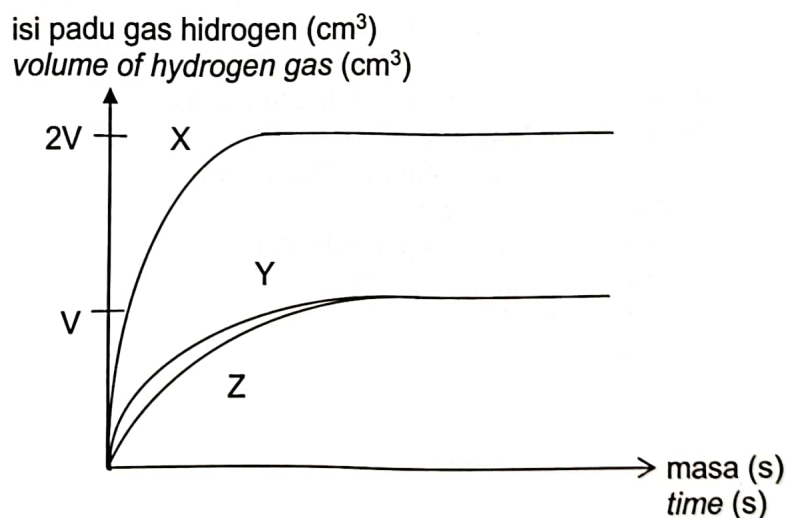
- A Pepejal Y berwarna putih semasa panas
Solid Y is white when hot
- B Garam Z adalah garam tak terlarutkan
Salt Z is insoluble salt
- C Tindak balas I adalah peneutralan
Reaction I is neutralisation
- D Logam A adalah zink
Metal A is zinc

- 40 Jadual 2 menunjukkan tindak balas antara serbuk zink berlebihan dengan asid hidroklorik yang berlainan kepekatan.
Table 2 shows the reaction between excess zinc powder and hydrochloric acid of different concentrations.

Eksperimen <i>Experiment</i>	Bahan tindak balas <i>Reactants</i>
I	Zink berlebihan + 50 cm ³ asid hidroklorik 0.1 mol dm ⁻³ <i>Excess zinc + 50 cm³ of 0.1 mol dm⁻³ hydrochloric acid</i>
II	Zink berlebihan + 20 cm ³ asid hidroklorik 0.5 mol dm ⁻³ <i>Excess zinc + 20 cm³ of 0.5 mol dm⁻³ hydrochloric acid</i>
III	Zink berlebihan + 25 cm ³ asid hidroklorik 0.2 mol dm ⁻³ <i>Excess zinc + 25 cm³ of 0.2 mol dm⁻³ hydrochloric acid</i>

Jadual 2
Table 2

Rajah 18 mewakili keputusan tiga eksperimen tersebut.
Diagram 18 represents the results of the three experiments.



Rajah 18
Diagram 18

Di antara lengkung-lengkung isi padu gas hidrogen melawan masa dalam Rajah 18 yang manakah mewakili keputusan tiga eksperimen itu dengan tepat?
Which of the curves of volume of hydrogen gas against time in Diagram 18 accurately represents the results of the three experiments?

	Eksperimen I <i>Experiment I</i>	Eksperimen II <i>Experiment II</i>	Eksperimen III <i>Experiment III</i>
A	Z	X	Y
B	Z	Y	X
C	X	Y	Z
D	Y	X	Z

– KERTAS SOALAN TAMAT –
 – END OF QUESTION PAPER –