

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 28 halaman bercetak.

- 1 Rajah 1 menunjukkan satu peralatan keselamatan yang ditemui di dalam makmal.
 Diagram 1 shows a safety equipment found in a laboratory.



aDiN

Rajah 1

Diagram 1

Apakah nama peralatan tersebut?

What is the name of the equipment?

- A Penggera kebakaran
Fire alarm
- B Kebuk wasap
Fume chamber
- C Alat pemadam kebakaran
Fire extinguisher
- D Pancuran air dan pembasuh mata
Shower and eyewash

- 2 Antara pernyataan berikut, yang manakah benar bagi 1 mol bahan?
Which of the following statements is true about 1 mole of substance?
- A 1 mol kuprum mengandungi 6.02×10^{23} molekul
1 mole of copper contains 6.02×10^{23} molecules
- B 1 mol gas neon mengandungi 6.02×10^{23} atom
1 mole of neon gas contains 6.02×10^{23} atoms
- C 1 mol gas oksigen mengandungi 6.02×10^{23} atom
1 mole of oxygen gas contains 6.02×10^{23} atoms
- D 1 mol air mengandungi 6.02×10^{23} atom
1 mole of water contains 6.02×10^{23} atoms
- 3 Pernyataan manakah yang paling baik menerangkan tentang pembentukan ikatan kovalen?
Which statement is best explains the formation of a covalent bond?
- A Atom logam berkongsi elektron dengan atom bukan logam
Metal atoms share electrons with non-metal atoms
- B Atom bukan logam berkongsi elektron dengan atom bukan logam
Non-metal atoms share electrons with non-metal atoms
- C Atom logam menderma elektron manakala atom bukan logam menerima elektron
Metal atoms donate electrons while non-metal atoms accept electrons
- D Atom bukan logam menderma elektron manakala atom logam menerima elektron
Non-metal atoms donate electrons while metal atoms accept electrons

| | |
|----------------------------------|----------------------------------|
| Nafthalena <i>Naphthalene</i> | Air <i>Water</i> |
| Air <i>Water</i> | Nafthalena <i>Naphthalene</i> |

4 Antara berikut, yang manakah mempunyai kadar tindak balas yang paling tinggi?

Which of the following has the highest rate of reaction?

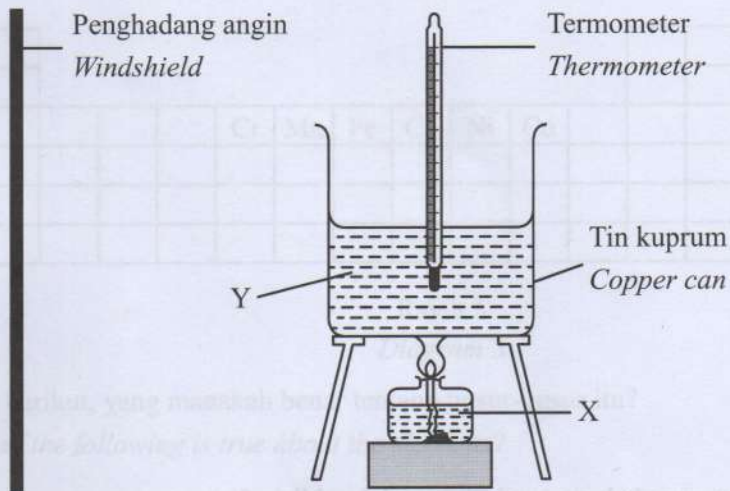
- A Pengaratan besi
Rusting of iron
- B Penapaian glukosa
Fermentation of glucose
- C Penguraian makanan
Decomposition of food
- D Pembakaran alkohol
Combustion of alcohol

5 Antara berikut, yang manakah adalah benar tentang tindak balas penurunan?

Which of the following is true about the reduction reaction?

- A Kehilangan elektron
Loss of electron
- B Penambahan hidrogen
Gain of hydrogen
- C Penambahan oksigen
Gain of oxygen
- D Peningkatan nombor pengoksidaan
Increase in oxidation number

- 6 Rajah 2 menunjukkan susunan radas bagi menentukan haba pembakaran etanol, C_2H_5OH .
Diagram 2 shows the apparatus set-up to determine the heat of combustion of ethanol, C_2H_5OH .



Rajah 2
Diagram 2

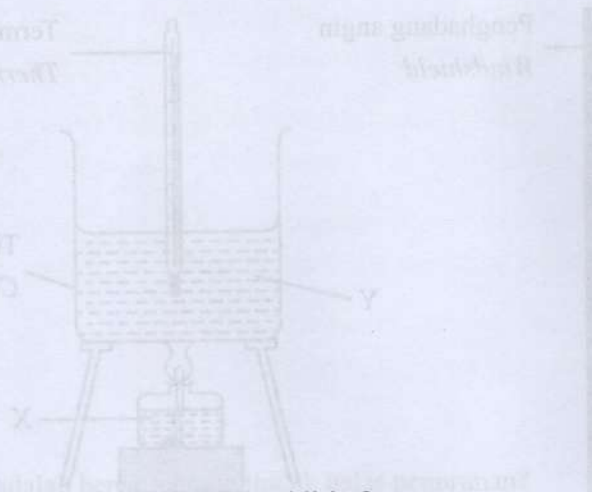
Apakah X dan Y?

What are X and Y?

| | X | Y |
|---|--------------------------|--------------------------|
| A | Etanol Ethanol | Air Water |
| B | Air Water | Etanol Ethanol |
| C | Naftalena Naphthalene | Air Water |
| D | Air Water | Naftalena Naphthalene |

7 Apakah sumber utama dalam penghasilan sabun?
 What is the main source in the production of soap?

- A Sulfur
Sulphur
- B Petroleum
Petroleum
- C Asid
Acid
- D Minyak
Oil



8 Antara berikut, yang manakah merupakan contoh bagi jirim?
 Which of the following is an example of matter?

- A Haba
Heat
- B Udara
Air
- C Cahaya
Light

| Y | X |
|----------|----------|
| Air | Ethanol |
| Water | Ethanol |
| Ethanol | Air |
| Ethanol | Water |
| Air | Nitrogen |
| Water | Nitrogen |
| Nitrogen | Air |
| Nitrogen | Water |

- 10 Oksida logam X berwarna kuning semasa panas dan berwarna putih semasa sejuk.
Apakah X?

Metal oxide X is yellow when hot and white when cold.

What is X?

A Ferum

Iron

B Kuprum

Copper

C Zink

Zinc

D Plumbum

Lead

- 11 Apabila kaca X dipanaskan pada suhu tinggi dan terus dimasukkan ke dalam air sejuk, X tidak retak.

Apakah kaca yang mungkin mewakili X?

When glass X is heated to high temperature and quickly put into cold water, X does not crack.

What is the possible glass that represent X?

A Kaca soda kapur

Soda-lime glass

B Kaca silika terlakur

Fused silica glass

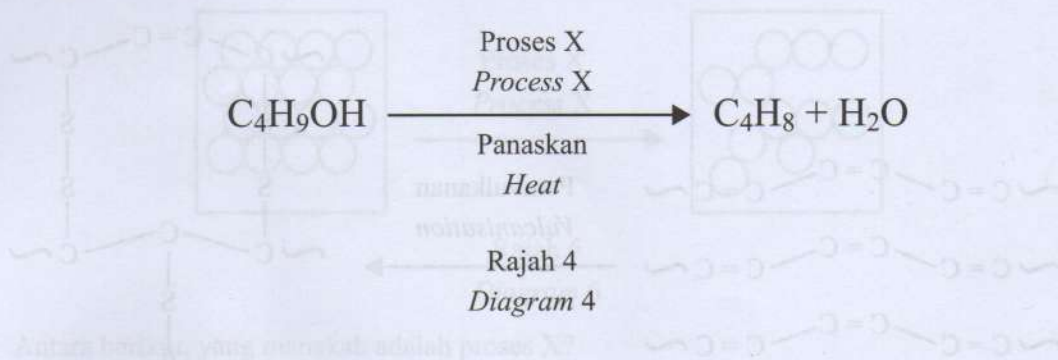
C Kaca plumbum

Lead crystal glass

D Kaca borosilikat

Borosilicate glass

- 12 Rajah 4 menunjukkan persamaan kimia penukaran butanol kepada butena.
 Diagram 4 shows the chemical equation of the conversion of butanol to butene.



Apakah proses X?
 What is process X?

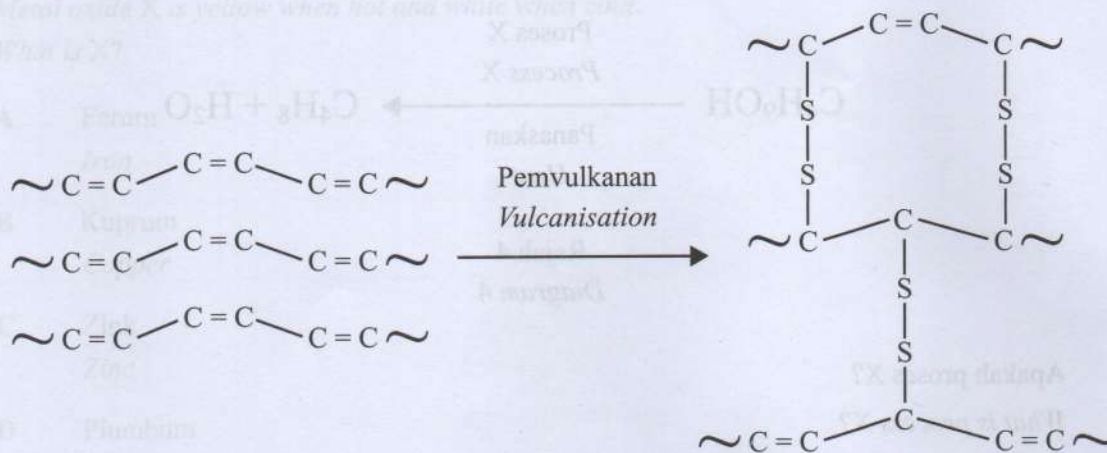
- A Pengoksidaan
Oxidation
- B Hidrolisis
Hydrolysis
- C Pendehidratan
Dehydration
- D Penghidrogenan
Hydrogenation

- 15 Unsur X berada dalam Kumpulan 18 dalam Jadual Berkala Unsur. Unsur X bukan logam. Unsur X digunakan di dalam lampu neon.
 Element X is located in Group 18 in the Periodic Table of Elements. Element X is not a metal. Element X is used in the advertising board lights.
 What is X?

- A Helium
Helium
- B Argon
Argon
- C Neon
Neon
- D Krypton
Krypton

13 Rajah 5 menunjukkan proses pemvulkanan getah.

Diagram 5 shows the vulcanisation process of rubber.



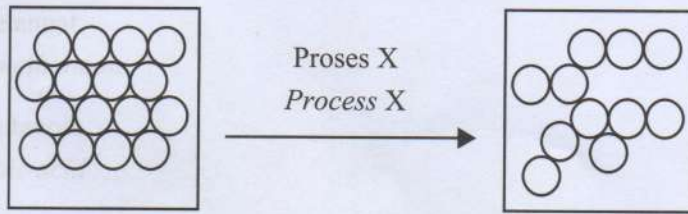
Rajah 5
Diagram 5

Antara berikut, yang manakah benar tentang getah ter Vulkan? *Which of the following are true about vulcanised rubber?*

Which of the following are true about vulcanised rubber?

- A Lebih mudah teroksidasi
Easier to be oxidised
- B Lebih kenyal
More elastic
- C Kurang tahan haba yang tinggi
Less resistant to high heat
- D Lembut
Soft

- 14 Rajah 6 menunjukkan susunan zarah bagi pertukaran keadaan jirim.
Diagram 6 shows the particles arrangement for the change of state of matter.



Rajah 6
Diagram 6

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

- A Peleburan
Melting
 - B Kondensasi
Condensation
 - C Penyejatan
Evaporation
 - D Pemejalwapan
Sublimation
- 15 Unsur X berada dalam Kumpulan 18 dalam Jadual Berkala Unsur. X bukan simbol sebenar unsur tersebut. Unsur X digunakan di dalam lampu papan iklan.
Apakah X?

Element X is located in Group 18 in the Periodic Table of Element. X is not the actual symbol of the element. Element X is use in the advertising board lights.

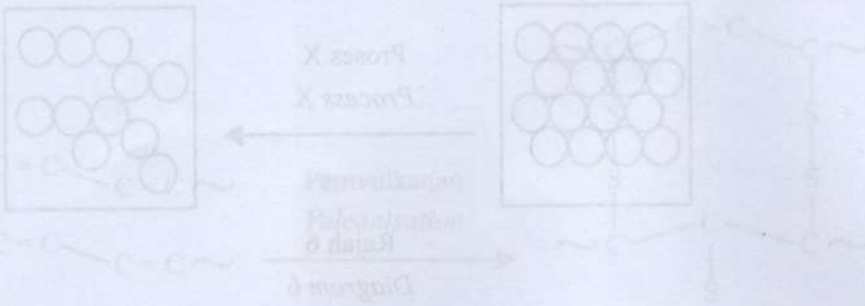
What is X?

- A Helium
Helium
- B Argon
Argon
- C Neon
Neon
- D Krypton
Krypton

- 16 Antara berikut, yang manakah menunjukkan sifat asid bagi asid sulfurik?

Which of the following shows the acidic properties of sulphuric acid?

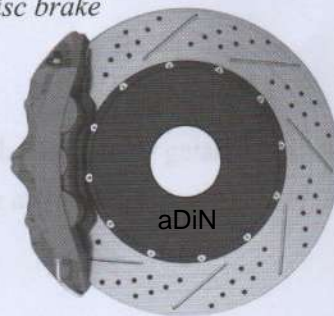
- A H_2SO_4
 B H_3O^+
 C OH^-
 D SO_4^{2-}



- 17 Rajah 7 menunjukkan sejenis produk yang dihasilkan daripada teknologi seramik termaju.

Diagram 7 shows a type of product produced from advanced ceramic technology.

Cakera brek
 Disc brake



Rajah 7
 Diagram 7

Nyatakan nama bahan yang digunakan untuk membentuk seramik tersebut.

State the name of the substance used to form the ceramic.

- A Silikon karbida
Silicon carbide
 B Titanium karbida
Titanium carbide
 C Aluminium oksida
Aluminium oxide
 D Zink oksida
Zinc oxide

18 Antara berikut, yang manakah merupakan ahli dalam ester?

Which of the following are the members of esters?

- I Etil metanoat
Ethyl methanoate
- II Asid butanoik
Butanoic acid
- III Asid propanoik
Propanoic acid
- IV Metil pentanoat
Methyl pentanoate

A I dan II

I and II

B II dan III

II and III

C III dan IV

III and IV

D I dan IV

I and IV

19 Rajah 8 menunjukkan suatu contoh pembungkusan makanan.

Diagram 8 shows an example of food packaging.



Rajah 8

Diagram 8

Antara berikut, yang manakah menerangkan mengapa pembungkusan itu mencemarkan alam sekitar?

Which of the following explains why the packaging pollutes the environment?

- I Terbiodegradasi dengan mudah
Easily biodegradable
- II Membebaskan gas beracun apabila dibakar
Releases poisonous gases when heated
- III Menyebabkan pembentukan alga
Causes the formation of algae
- IV Menyebabkan sistem perparitan tersumbat dan banjir kilat
Causes blockage of drainage system and flash flood

A I dan II

I and II

B II dan III

II and III

C I dan IV

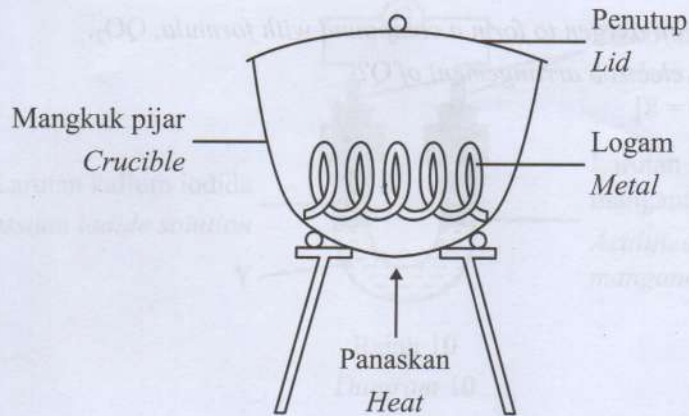
I and IV

D II dan IV

II and IV

20 Rajah 9 menunjukkan susunan radas untuk menentukan formula empirik logam oksida.

Diagram 9 shows the apparatus set-up to determine the empirical formula of metal oxide.



Rajah 9

Diagram 9

Pernyataan yang manakah menerangkan mengapa mangkuk pijar perlu ditutup dengan penutupnya apabila logam mula terbakar?

Which statement explains why the crucible need to be covered by its lid when the metal starts to burn?

- A Untuk mengelakkan wasap logam oksida daripada terbebas
To prevent fumes of metal oxide from escaping
- B Untuk membenarkan oksigen bertindak balas dengan logam
To allow oxygen reacts with metal
- C Untuk mendapatkan jisim logam oksida yang tetap
To obtain a constant mass of metal oxide
- D Untuk mengelakkan logam terbakar dengan berlebihan
To avoid metal from over heating

- 21 Unsur Q bertindak balas dengan oksigen untuk membentuk satu sebatian dengan formula, QO_2 .
Apakah susunan elektron yang betul bagi Q?
[Nombor proton: O = 8]

Element Q reacts with oxygen to form a compound with formula, QO_2 .

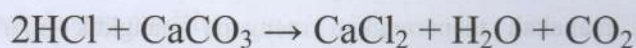
What is the correct electron arrangement of Q?

[Proton number: O = 8]

- A 2.1
- B 2.2
- C 2.3
- D 2.4

- 22 Persamaan berikut mewakili satu tindak balas.

The following equation represents a reaction.

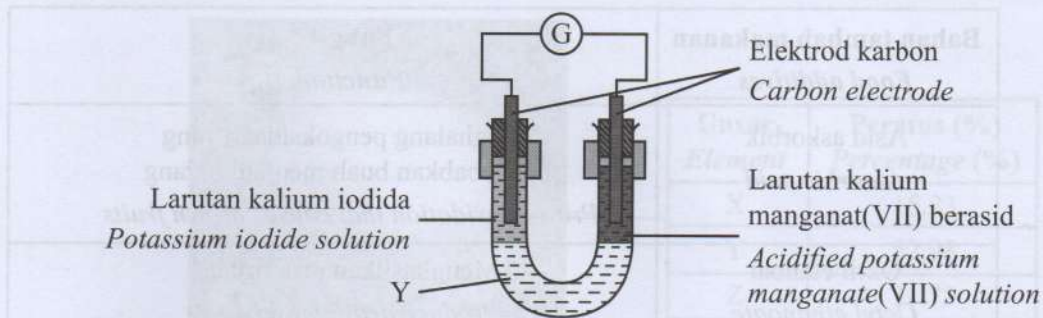


Antara berikut, kaedah manakah yang paling sesuai untuk meningkatkan kadar tindak balas?

Which of the following methods is the most suitable to increase the rate of reaction?

- A Menggunakan saiz kalsium karbonat yang lebih kecil
Use smaller size of calcium carbonate
- B Mengurangkan isi padu asid hidroklorik
Decrease the volume of hydrochloric acid
- C Menukarkan asid hidroklorik kepada asid nitrik
Change hydrochloric acid to nitric acid
- D Mengurangkan kepekatan asid hidroklorik
Decrease the concentration of hydrochloric acid

- 23 Rajah 10 menunjukkan susunan radas bagi pemindahan elektron pada suatu jarak dalam tiub-U.
Diagram 10 shows the apparatus set-up for the transfer of electrons at a distance in U-tube.



Rajah 10
Diagram 10

Nyatakan fungsi bagi Y.
State the function of Y.

- A Membenarkan pemindahan elektron dari terminal negatif ke terminal positif
Allow the transfer of electrons from negative terminal to positive terminal
- B Menerima elektron dari larutan kalium iodida
Accept electrons from potassium iodide solution
- C Bertindak sebagai agen pengoksidaan
Act as an oxidising agent
- D Membenarkan pengaliran ion dari kedua-dua larutan
Allow the flow of ions from both solutions
- 24 Tindak balas manakah yang menyerap haba dari persekitaran?
Which reaction absorbs heat from the surrounding?
- A Zink ditambahkan ke dalam asid sulfurik
Zinc is added into sulphuric acid
- B Air ditambahkan kepada pepejal ammonium nitrat
Water is added to solid ammonium nitrate
- C Air ditambahkan kepada pepejal natrium hidroksida
Water is added to solid sodium hydroxide
- D Zink ditambahkan ke dalam larutan kuprum(II) sulfat
Zinc is added into copper(II) sulphate solution

25 Bahan tambah makanan manakah dipadankan dengan betul?

Which food additives is matched correctly?

| | Bahan tambah makanan <i>Food additives</i> | Fungsi <i>Function</i> |
|-----|--|---|
| I | Asid askorbik <i>Ascorbic acid</i> | Menghalang pengoksidaan yang menyebabkan buah menjadi perang <i>Prevent oxidation that causes brown fruits</i> |
| II | Oktil etanoat <i>Octyl ethanoate</i> | Menghasilkan rasa tiruan <i>Produce artificial flavour</i> |
| III | Pektin <i>Pectin</i> | Menghalang makanan daripada rosak <i>Prevent food from being spoil</i> |
| IV | Aspartam <i>Aspartame</i> | Memekatkan makanan <i>Thicken the food</i> |

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

26 Berapakah bilangan atom dalam 0.5 mol gas ammonia?

[Pemalar Avogadro = $6.02 \times 10^{23} \text{ mol}^{-1}$]

What is the number of atoms in 0.5 mol of ammonia gas?

[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 $0.5 \times 2 \times 6.02 \times 10^{23}$

D $0.5 \times 4 \times 6.02 \times 10^{23}$

- 27 Rajah 11 menunjukkan komposisi suatu sebatian.
Diagram 11 shows the composition of a certain compound.



| Unsur Element | Peratus (%) Percentage (%) |
|------------------|-------------------------------|
| X | 15.23 |
| Y | 52.98 |
| Z | 31.79 |

Rajah 11
Diagram 11

Apakah formula empirik bagi sebatian tersebut?

[Jisim atom relatif: X = 23; Y = 80; Z = 16]

What is the empirical formula of the compound?

[Relative atomic mass: X = 23; Y = 80; Z = 16]

- A XYZ₃
B XY₂Z
C XYZ
D XYZ₄

- 28 Jisim formula relatif bagi garam, $M_2(SO_4)_3$ ialah 342.

Berapakah jisim atom relatif bagi unsur M?

[Jisim atom relatif: O = 16, S = 32]

The relative formula mass of salt, $M_2(SO_4)_3$ is 342.

What is the relative atomic mass of element M?

[Relative atomic mass: O = 16, S = 32]

- A 14
B 27
C 54
D 108

- 29 Amin ingin menyediakan 250 cm^3 larutan natrium hidroksida 0.3 mol dm^{-3} .

Berapakah jisim natrium hidroksida yang Amin perlukan untuk menghasilkan larutan tersebut?

[Jisim atom relatif: Na = 23, O = 16, H = 1]

Amin wants to prepare 250 cm^3 of 0.3 mol dm^{-3} sodium hydroxide solution.

What is the mass of sodium hydroxide does Amin need to produce the solution?

[Relative atomic mass: Na = 23, O = 16, H = 1]

- A 0.075 g
B 1.000 g
C 2.075 g
D 3.000 g

- 26 Berapakah bilangan atom dalam 0.5 mol gas ammonia?

[Constant Avogadro = $6.02 \times 10^{23} \text{ mol}^{-1}$]

What is the number of atoms in 0.5 mol of ammonia gas?

[Avogadro constant = $6.02 \times 10^{23} \text{ mol}^{-1}$]

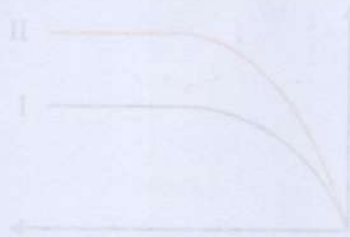
- A 6.02×10^{23}
B $6.5 \times 6.02 \times 10^{23}$
C $0.5 \times 2 \times 6.02 \times 10^{23}$
D $0.5 \times 4 \times 6.02 \times 10^{23}$

30. 0.2 mol serbuk magnesium bertindak balas dengan asid hidroklorik cair berlebihan. Selepas 50 saat, didapati 0.05 mol magnesium tertinggal sebagai baki. Berapakah kadar tindak balas purata?

0.2 mol of magnesium powder reacts with excess dilute hydrochloric acid. After 50 seconds, 0.05 mol of magnesium remains as residue.

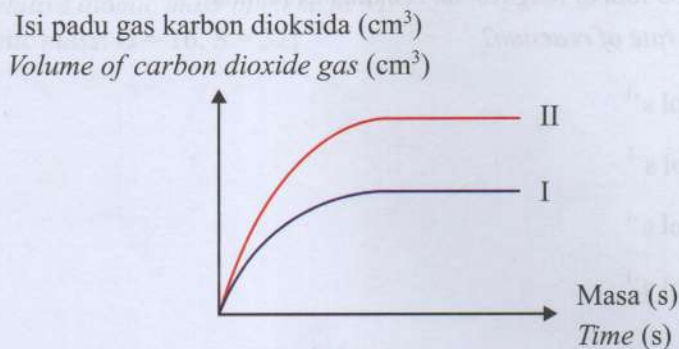
What is the average rate of reaction?

- A $1.0 \times 10^{-3} \text{ mol s}^{-1}$
 B $2.0 \times 10^{-3} \text{ mol s}^{-1}$
 C $3.0 \times 10^{-3} \text{ mol s}^{-1}$
 D $4.0 \times 10^{-3} \text{ mol s}^{-1}$



33. Sebuah manakah asid hidroklorik yang paling tepat? *Which compound is the most suitable?*
- A. Propena
Propene
- B. 50 cm³ asid nitrik 2.0 mol dm⁻³
50 cm³ of 2.0 mol dm⁻³ nitric acid
- C. 50 cm³ asid hidroklorik 1.0 mol dm⁻³
50 cm³ of 1.0 mol dm⁻³ hydrochloric acid
- D. 50 cm³ asid sulfurik 2.0 mol dm⁻³
50 cm³ of 2.0 mol dm⁻³ sulfuric acid
34. Latex boleh disimpan dalam keadaan cecair dengan menambahkan... *Latex can be kept in liquid state by adding...*
- A. asid formik
formic acid
- B. asid etanoik
ethanoic acid
- C. larutan ammonium
ammonium solution
- D. ammonia
ammonia

- 31 Rajah 12 menunjukkan lengkung II apabila marmar berlebihan bertindak balas dengan 50 cm^3 asid hidroklorik 2.0 mol dm^{-3} menghasilkan gas karbon dioksida.
 Diagram 12 shows curve II when excess marble reacted with 50 cm^3 of 2.0 mol dm^{-3} hydrochloric acid produce carbon dioxide gas.



Rajah 12
 Diagram 12

Sekiranya eksperimen diulang dengan menggunakan larutan lain, larutan manakah yang akan menghasilkan lengkung I dalam Rajah 12?

If the experiment repeated using another solution, which solution will produce curve I in Diagram 12?

- A 50 cm^3 asid hidroklorik 1.0 mol dm^{-3}
 50 cm^3 of 1.0 mol dm^{-3} hydrochloric acid
- B 50 cm^3 asid nitrik 2.0 mol dm^{-3}
 50 cm^3 of 2.0 mol dm^{-3} nitric acid
- C 100 cm^3 asid hidroklorik 1.0 mol dm^{-3}
 100 cm^3 of 1.0 mol dm^{-3} hydrochloric acid
- D 25 cm^3 asid sulfurik 2.0 mol dm^{-3}
 25 cm^3 of 2.0 mol dm^{-3} sulphuric acid

- 32 Haba pembakaran etanol adalah $-1\ 371\ \text{kJ mol}^{-1}$.
 Jika 3 g etanol dibakar untuk memanaskan $300\ \text{cm}^3$ air, hitungkan perubahan suhu.
 [Jisim atom relatif: H = 1, C = 12, O = 16; Muatan haba tentu air = $4.2\ \text{J g}^{-1}\ \text{°C}^{-1}$]

The heat of combustion of ethanol is $-1\ 371\ \text{kJ mol}^{-1}$.

If 3 g of ethanol is burnt to heat up $300\ \text{cm}^3$ of water, calculate the temperature change.

[Relative atomic mass: H = 1, C = 12, O = 16; Specific heat capacity of water = $4.2\ \text{J g}^{-1}\ \text{°C}^{-1}$]

- A $24\ \text{°C}$
 B $71\ \text{°C}$
 C $80\ \text{°C}$
 D $95\ \text{°C}$

- 33 Sebati manakah adalah suatu hidrokarbon tak tepu?

Which compound is unsaturated hydrocarbon?

A Propena
Propene

B Propana
Propane

C Kloropropana
Chloropropane

D Propanol
Propanol

- 34 Lateks boleh disimpan dalam keadaan cecair dengan menambahkan

Latex can be kept in liquid state by adding

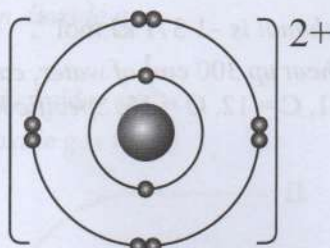
A asid formik
formic acid

B asid etanoik
ethanoic acid

C larutan ammonia
ammonia solution

D ammonium sulfat
ammonium sulphate

- 35 Rajah 13 menunjukkan susunan elektron bagi ion Y.
Diagram 13 shows electron arrangement of the Y ion.



Rajah 13
Diagram 13

Berapakah bilangan elektron valens bagi atom Y?
What is the number of valence electron for atom Y?

- A 1
B 2
C 6
D 7
- 36 Antara sebatian berikut, manakah akan bertindak balas dengan zink untuk membebaskan gas hidrogen?
Which of the following compounds will react with zinc to release hydrogen gas?
- A $\text{CH}_3\text{CH}_2\text{OH}$
B $\text{CH}_3\text{COOCH}_3$
C CH_3COOH
D CH_3CHCH_2

- 37 Seorang budak lelaki disengat lebah ketika berada di kebun bapanya.
Antara berikut, bahan manakah yang sesuai digunakan untuk mengurangkan kesakitan budak lelaki itu?

A boy was stung by a bee while in his father's garden.

Which of the following substance is suitable to reduce the boy's pain?

- A Minuman ringan
Soft drink
- B Cuka
Vinegar
- C Serbuk penaik
Baking soda
- D Serbuk kopi
Coffee powder

- 38 Jadual 1 menunjukkan keputusan bagi tindak balas penyerasan bagi logam M, N, O, dan P.
Table 1 shows results of displacement reaction for metal M, N, O and P.

| Logam <i>Metal</i> | Larutan <i>Solution</i> | Ag(NO ₃) | Cu(NO ₃) ₂ | MgSO ₄ | ZnSO ₄ |
|-----------------------|----------------------------|----------------------|-----------------------------------|-------------------|-------------------|
| M | | ✓ | | × | × |
| N | | ✓ | ✓ | × | |
| O | | ✓ | ✓ | | ✓ |
| P | | | × | × | × |

Jadual 1

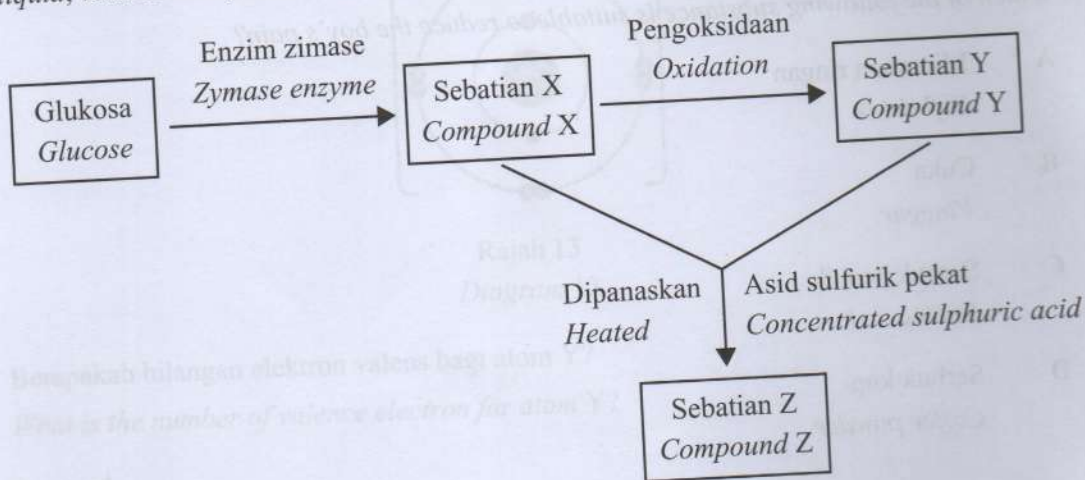
Table 1

Logam manakah mempunyai kecenderungan paling tinggi untuk mendermakan elektron bagi membentuk ion?

Which metal has the highest tendency to donate electrons to form an ion?

- A M
- B N
- C O
- D P

- 39 Rajah 14 menunjukkan penukaran sebatian X kepada sebatian Y. Sebatian X adalah cecair tanpa warna, mudah meruap dan larut di dalam air.
 Diagram 14 shows the conversion of compound X into compound Y. Compound X is a colourless liquid, volatile easily and soluble in water.



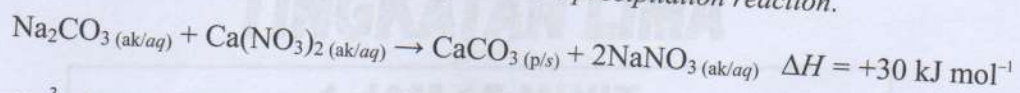
Rajah 14
 Diagram 14

Tindak balas antara sebatian X dan sebatian Y akan menghasilkan sebatian Z.
 Apakah sebatian Z?

Reaction between compound X and compound Y will produce compound Z.
 What is compound Z?

- A Etil etanoat
Ethyl ethanoate
- B Asid etanoik
Ethanoic acid
- C Etanol
Ethanol
- D Metil propanoat
Methyl propanoate

- 40 Persamaan termokimia berikut mewakili suatu tindak balas pemendakan.
The following thermochemical equation represents a precipitation reaction.



100 cm³ larutan natrium karbonat 1.0 mol dm⁻³ ditambahkan kepada 100 cm³ larutan kalsium nitrat 1.0 mol dm⁻³.

Apakah perubahan suhu campuran ini?

[Muatan haba tentu larutan = 4.2 J g⁻¹ °C⁻¹; Ketumpatan larutan = 1 g cm⁻³]

100 cm³ of 1.0 mol dm⁻³ sodium carbonate solution is added to 100 cm³ of 1.0 mol dm⁻³ calcium nitrate solution.

What is the temperature change of this mixture?

[Specific heat capacity of the solution = 4.2 J g⁻¹ °C⁻¹; Density of the solution = 1 g cm⁻³]

A 0.4 °C

B 0.7 °C

C 3.6 °C

D 7.1 °C

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

NAMA:

TINGKATAN: