

- 1 Which of the following substance is made up of ion?  
*Antara bahan berikut yang manakah terdiri daripada ion?*
- A Zinc  
*Zink*
  - B Ammonium chloride  
*Ammonium klorida*
  - C Naphthalene  
*Naftalena*
  - D Oxygen gas  
*Gas oksigen*
- 2 What is the meaning of Avogadro constant?  
*Apakah yang dimaksudkan dengan pemalar Avogadro?*
- A Number of particles in one mole a substance  
*Bilangan zarah dalam satu mol bahan*
  - B Pressure of one mole of a substance  
*Tekanan bagi satu mol bahan*
  - C Volume occupied by one mole of gas  
*Isipadu yang dipenuhi oleh satu mol gas*
  - D Mass of one mole of a substance  
*Jisim bagi satu mol bahan*
- 3 Metal Y is soft and shiny. It reacts with water to produce a solution which turns red litmus paper to blue. What is metal Y?  
*Logam Y bersifat lembut dan berkilat. Ia bertindak balas dengan air untuk menghasilkan satu larutan yang menukarkan kertas litmus merah kepada biru. Apakah logam Y?*
- A Iron  
*Ferum*
  - B Copper  
*Kuprum*
  - C Potassium  
*Kalium*
  - D Tin  
*Stanium*

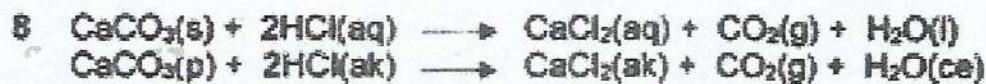
- 4 Which of the following is an ionic compound?  
*Antara berikut, yang manakah adalah sebatian ion?*
- A  $H_2O$
  - B  $SO_3$
  - C  $NH_3$
  - D  $MgBr_2$
- 5 Which of the following is correct about an electrolyte?  
*Antara berikut, manakah betul tentang elektrolit?*
- A Has free moving ions in aqueous state  
*Mempunyai ion-ion yang bergerak bebas dalam keadaan akues*
  - B Exists as liquid at room temperature  
*Wujud sebagai cecair pada suhu bilik*
  - C Dissolves in water  
*Larut dalam air*
  - D Can conducts electricity in solid state  
*Boleh menghantarkan elektrik dalam keadaan pepejal*
- 6 Which of the following particles in ammonia solution shows alkaline properties?  
*Antara zarah-zarah dalam larutan ammonia, yang manakah menunjukkan sifat alkali?*
- A  $H^+$
  - B  $OH^-$
  - C  $NH_4^+$
  - D  $NH_3$



- 7 Which of the following salts can be prepared by precipitation reaction?  
*Antara berikut garam manakah boleh disediakan melalui tindak balas pemendakan?*

- I Zinc nitrate  
*Zink nitrat*
- II Barium sulphate  
*Barium sulfat*
- III Silver chloride  
*Argentum klorida*
- IV Potassium carbonate  
*Kalium karbonat*

- A I and III only  
*I dan III sahaja*
- B II and III only  
*II dan III sahaja*
- C III and IV only  
*III dan IV sahaja*
- D I and II only  
*I dan II sahaja*

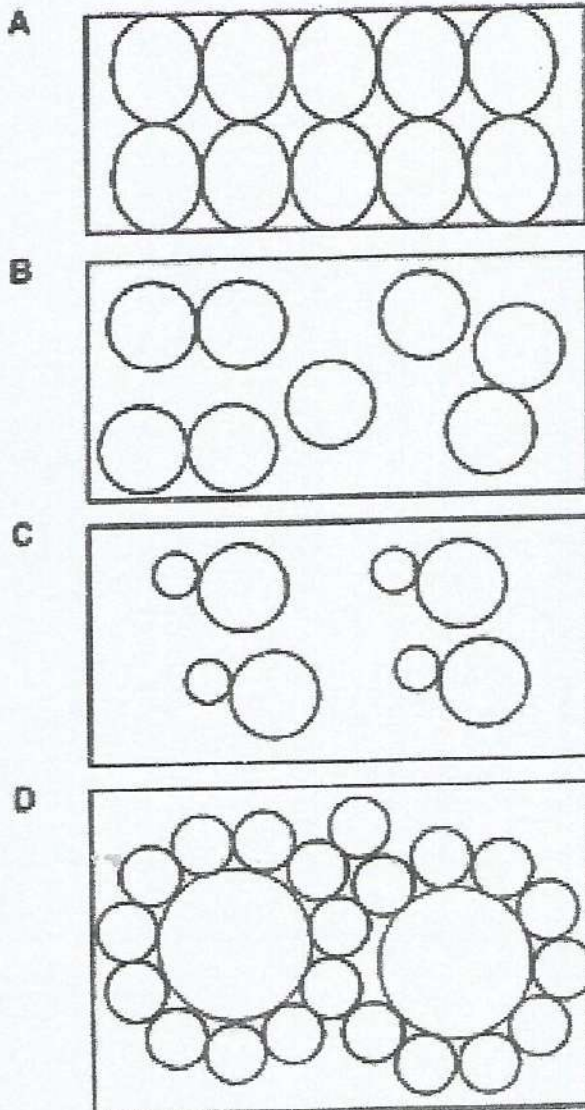


Based on the chemical equation above, what changes can be observed to determine the rate of reaction?

*Berdasarkan persamaan kimia diatas, apakah perubahan yang dapat diperhatikan untuk menentukan kadar tindak balas?*

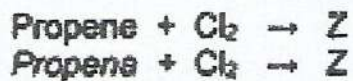
- A Volume of gas liberated increased  
*Pertambahan isipadu gas yang terbebas*
- B Mass of reactant increased  
*Pertambahan jisim bahan tindak balas*
- C The volume of reactant solution is decrease  
*Pengurangan isipadu larutan bahan tindak balas*
- D Precipitation produce is reduce  
*Mendakan yang terbentuk berkurang*

- 9 Which diagram shows the arrangement of particles in an alloy?  
Rajah yang manakah menunjukkan susunan zarah dalam aloi?



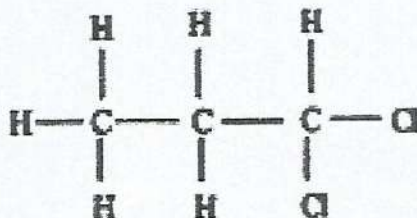


- 10 The following equation represents the reaction between propene and chlorine.  
*Persamaan berikut mewakili tindak balas antara propena dan klorin.*

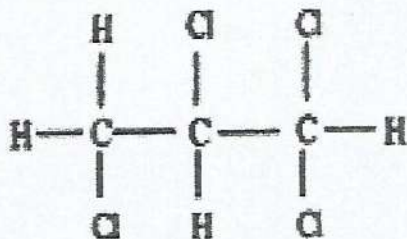


Which of the following is the structural formula for Z?  
*Antara berikut yang manakah adalah formula struktur bagi Z?*

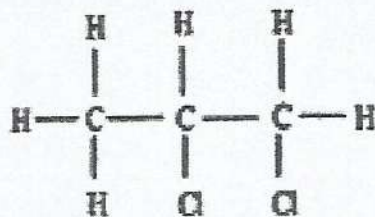
A



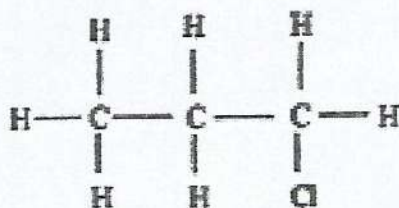
B



C



D



- 11 Which of the following occurred during oxidation?  
*Antara berikut, yang manakah berlaku semasa proses pengoksidaan?*
- A Loss of oxygen  
*Kehilangan oksigen*
  - B Gain of hydrogen  
*Terima hidrogen*
  - C Loss of electron  
*Kehilangan elektron*
  - D Decrease in oxidation number  
*Pengurangan nombor pengoksidaan*
- 12 When zinc is dissolved in hydrochloric acid, the temperature is increased. This type of energy change is described as  
*Apabila zink dilarutkan dalam asid hidroklorik, suhu didapati meningkat. Jenis perubahan haba ini digambarkan sebagai*
- A Exothermic  
*Eksotermik*
  - B Isothermic  
*Isotermik*
  - C Endothermic  
*Endotermik*
  - D Polyisothermic  
*Poliisotermik*
- 13 Che Nom wants to bake a cheese tart which is sweet but has low calories and attractive in colour.  
*Which substance should be added into the cheese tart?*  
*Che Nom ingin membakar tart keju yang manis tetapi mempunyai kurang kalori dan menarik warnanya.*  
*Bahan yang manakah perlu ditambah ke dalam tart keju itu?*
- A Monosodium glutamate and benzoic acid  
*Mononatrium glutamat dan asid benzoik*
  - B Monosodium glutamate and tartrazine  
*Mononatrium glutamat dan tartrazina*
  - C Aspartame and benzoic acid  
*Aspartam dan asid benzoik*
  - D Aspartame and tartrazine  
*Aspartam dan tartrazina*



- 14 Diagram 1 shows a model of an atom.  
*Rajah 1 menunjukkan satu model atom*

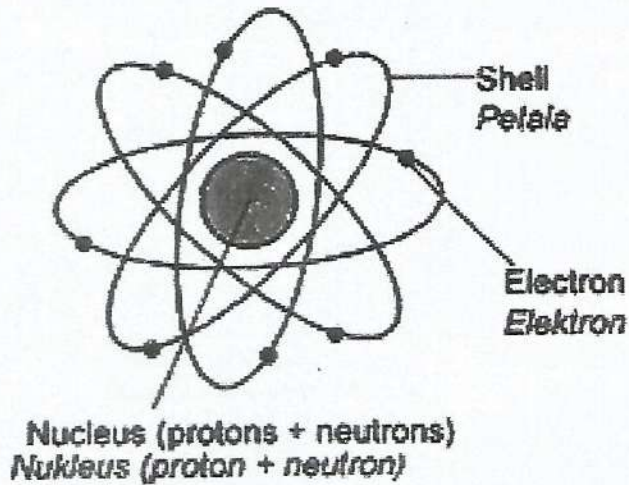


Diagram / Rajah 1

Who introduced this model?  
*Siapakah yang memperkenalkan model ini?*

- A J. J. Thomson
- B Ernest Rutherford
- C Niels Bohr
- D James Chadwick

- 15 Diagram 2 shows the apparatus set-up to determine the empirical formula of copper(II) oxide.

Rajah 2 menunjukkan susunan radas untuk menentukan formula empirik bagi kuprum(II) oksida.

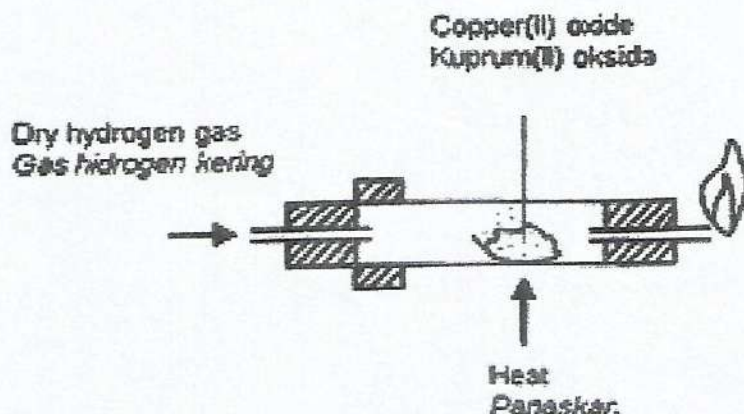


Diagram / Rajah 2

The dry hydrogen gas must be flowed through the apparatus for several minutes before heating the copper(II) oxide. What is the reason for this action to be taken?

Gas hidrogen kering mesti dialirkan melalui radas untuk beberapa minit sebelum pemanasan kuprum(II) oksida. Apakah sebab tindakan ini diambil?

- A To ensure all the copper(II) oxide has changed into copper.  
Untuk memastikan semua kuprum(II) oksida bertukar kepada kuprum.
- B To prevent copper from reacting with air to form copper(II) oxide.  
Untuk mengelakkan kuprum daripada bertindak balas dengan udara bagi membentuk kuprum(II) oksida.
- C To ensure all air has been removed so that explosion can be prevented.  
Untuk memastikan semua udara dikeluarkan supaya letupan dapat dielakkan
- D To prevent the water from flowing toward the hot porcelain dish and cracks the combustion tube.  
Untuk mengelakkan air daripada mengalir kearah piring porselin yang panas dan meretakkan tiub pembakaran.



- 16 Table 1 shows an atom E with its proton number and nucleon number.  
 Jadual 1 menunjukkan nombor proton dan nombor nukleon bagi atom E.

|                                  |    |
|----------------------------------|----|
| Proton number<br>Nombor proton   | 5  |
| Nucleon number<br>Nombor nukleon | 11 |

Table/Jadual 1

Which group and period is E located in the Periodic Table?  
 Kumpulan dan kala manakah E terletak dalam Jadual Berkala?

|   | Group<br>Kumpulan | Period<br>Kala |
|---|-------------------|----------------|
| A | 2                 | 3              |
| B | 3                 | 2              |
| C | 2                 | 13             |
| D | 13                | 2              |

- 17 Table 2 shows the electron arrangement of atom S and atom T.  
 Jadual 2 menunjukkan susunan elektron atom S dan atom T

| Element<br>Unsur | Electron arrangement<br>Susunan elektron |
|------------------|--|
| S                | 2.4                                      |
| T                | 2.8.7                                    |

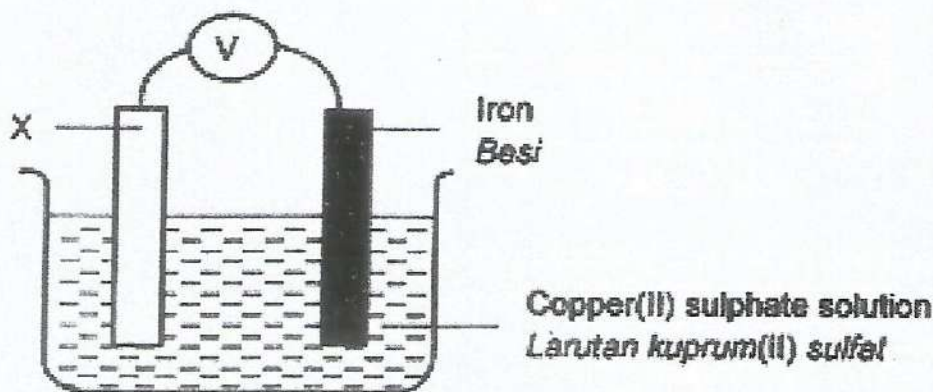
Table/Jadual 2

Which of the formula of the compound and the bond formed between element S and T?

Apakah formula dan jenis ikatan bagi sebatian yang terbentuk antara S dan T?

|   | Formula of compound<br>Formula sebatian | Bond<br>Ikatan |
|---|---|----------------|
| A | ST <sub>4</sub>                         | Covalent       |
| B | S <sub>4</sub> T                        | Ionic          |
| C | ST <sub>4</sub>                         | Ionic          |
| D | S <sub>4</sub> T                        | Covalent       |

- 18 Diagram 3 shows a simple voltaic cell.  
Rajah 3 menunjukkan suatu sel voltan ringkas.



Diagram/ Rajah 3

X electrode is a negative terminal. Which metal is suitable to be used as electrode X?  
Elektrod X adalah terminal negative. Logam manakah yang sesuai digunakan sebagai elektrod X?

- A Magnesium  
Magnesium
  - B Lead  
Plumbum
  - C Copper  
Kuprum
  - D Silver  
Argentum
- 19 Which pair of acids is classified correctly?  
Pasangan asid yang manakah dikelaskan dengan betul?

|   | Monoprotic acid<br>Asid monobas       | Diprotic acid<br>Asid dwibas          |
|---|---------------------------------------|---------------------------------------|
| A | Sulphuric acid<br>Asid sulfurik       | Carbonic acid<br>Asid karbonik        |
| B | Ethanoic acid<br>Asid etanoik         | Sulphuric acid<br>Asid sulfurik       |
| C | Carbonic acid<br>Asid karbonik        | Hydrochloric acid<br>Asid hidroklorik |
| D | Hydrochloric acid<br>Asid hidroklorik | Ethanoic acid<br>Asid etanoik         |



- 20 Which of the following ions form white precipitate that dissolves in excess ammonia solution?  
*Diantara ion-ion berikut yang manakah menghasilkan mendakan putih yang larut dalam larutan ammonia berlebihan?*
- A  $Mg^{2+}$   
 B  $Al^{3+}$   
 C  $Zn^{2+}$   
 D  $Pb^{2+}$
- 21 What is the property of ceramics that make them suitable to be insulating layers in the lining of furnaces?  
*Apakah sifat seramik yang membuatnya sesuai untuk menjadi lapisan penebat dalam lapisan relau?*
- A Chemically inert  
*Lengai terhadap bahan kimia*  
 B Heat insulator  
*Penebat haba*  
 C Hard and strong  
*Keras dan kuat*  
 D Electrical insulator  
*Penebat elektrik*
- 22 Diagram 4 shows an energy profile diagram for a reaction.  
*Rajah 4 menunjukkan gambar rajah aras tenaga bagi satu tindak balas.*
- Which of the following correct label of activation energy?  
*Antara berikut yang manakah dilabelkan dengan betul bagi tenaga pengaktifan?*

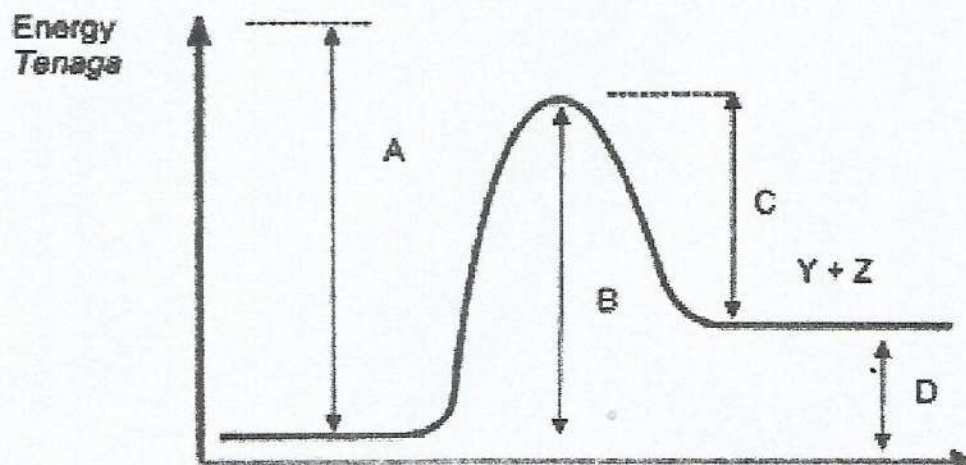
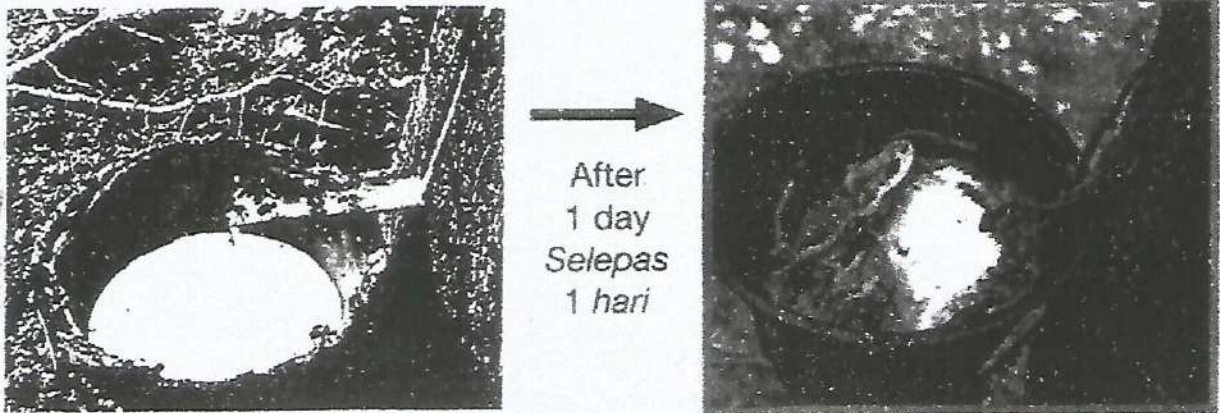


Diagram / Rajah 4

- 23 The diagram 5 below shows the natural change that occurs on latex. Choose the substance which is suitable to be added into latex to speed up the above change?  
*Rajah 5 di bawah menunjukkan perubahan yang berlaku pada lateks secara semulajadi. Pilih bahan manakah yang sesuai dicampurkan kepada lateks untuk mempercepatkan perubahan di bawah?*



Diagram/ Rajah 5

- A Ethanol  
*Etanol*
- B Formic acid  
*Asid formik*
- C Potassium nitrate solution  
*Larutan kalium nitrat*
- D Sodium hydroxide solution  
*Larutan natrium hidroksida*



- 24 The following chemical equation shows the reaction between carbon and copper(II) oxide.  
*Persamaan kimia berikut menunjukkan tindak balas antara karbon dengan kuprum(II) oksida.*

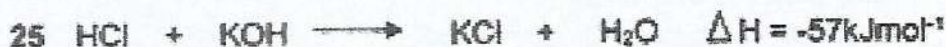


Which of the following statement is true about this reaction.

*Antara pernyataan berikut yang manakah benar berkaitan tindakbalas tersebut.*

- I Brown solid produced  
*Pepejal perang terhasil*
- II Carbon acts as an oxidising agent  
*Karbon bertindak sebagai agen pengoksidaan*
- III The oxidation number of copper increase from 0 to +2  
*Nombor pengoksidaan kuprum bertambah dari 0 kepada +2*
- IV The oxidation number of copper decreases from +2 to 0  
*Nombor pengoksidaan kuprum berkurang dari +2 kepada 0*

- A I and II  
*I dan II*
- B I and IV  
*I dan IV*
- C III and IV  
*III dan IV*
- D I, II and IV  
*I, II dan IV*

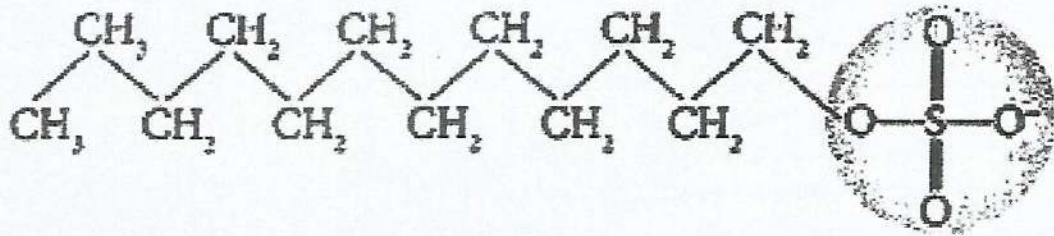


Based on thermochemical equation above, calculate the heat change when 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> HCl react with 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> KOH.

*Berdasarkan persamaan termokimia di atas, hitungkan perubahan haba apabila 50 cm<sup>3</sup>, 0.1 mol dm<sup>-3</sup> HCl bertindakbalas dengan 50 cm<sup>3</sup>, 0.1 mol dm<sup>-3</sup> KOH.*

- A 57 J
- B 285 J
- C 357 J
- D 385 J

- 26 Diagram 6 shows the structural formula of X.  
Rajah 6 menunjukkan formula struktur X.



Diagram/ Rajah 6

What is X?  
Apakah X?

- A Soap  
Sabun
  - B Carboxylic acid  
Asid karbosilik
  - C Sulphuric acid  
Asid sulfurik
  - D Detergent  
Detergen
- 27 Which substance is an element?  
Bahan manakah yang merupakan suatu unsur?
- A Naphthalene  
Naftalena
  - B Steam  
Stim
  - C Air  
Udara
  - D Neon  
Neon



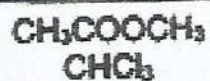
- 28 Which of the following pairs of compounds are in the same homologous series?  
*Antara pasangan sebatian berikut, yang manakah berada dalam siri homolog yang sama?*

|   | Compound 1<br>Sebatian 1 | Compound 2<br>Sebatian 2 |
|---|--------------------------|--------------------------|
| A | $C_2H_4$                 | $C_3H_6$                 |
| B | $C_2H_6$                 | $C_3H_8$                 |
| C | $C_2H_5OH$               | $CH_3CO_2H$              |
| D | $C_2H_5OH$               | $C_2H_5COOH$             |

- 29 Metal Y react with chlorine to form a green solid,  $YCl_2$  or brown solid,  $YCl_3$ .  
 Based on the product of reaction above, where is the position of metal Y in the periodic table element.  
*Logam Y bertindak balas dengan klorin menghasilkan pepejal hijau  $YCl_2$  atau pepejal perang  $YCl_3$ .  
 Berdasarkan hasil tindak balas di atas, di manakah kedudukan logam Y di dalam jadual berkala unsur?*

- A Alkali metal group  
*Kumpulan logam alkali*
- B Halogen group  
*Kumpulan halogen*
- C Transition element group  
*Kumpulan logam peralihan*
- D Noble gases group  
*Kumpulan gas adi*

- 30 Table 3 shows the chemical formula of two compound.  
*Jadual 3 menunjukkan formula kimia bagi dua sebatian.*



Table/Jadual 3

Which property of both compounds is similar?  
*Sifat manakah yang sama bagi kedua-dua sebatian?*

- A Melting point  
*Takat lebur*
- B Solubility  
*Keterlarutan*
- C Density  
*Ketumpatan*
- D Molar mass  
*Jisim molar*



- 31 Diagram 7 shows the set up of apparatus for an experiment involving a chemical cell. *Rajah 7 di bawah menunjukkan susunan radas bagi satu eksperimen yang melibatkan sel kimia.*

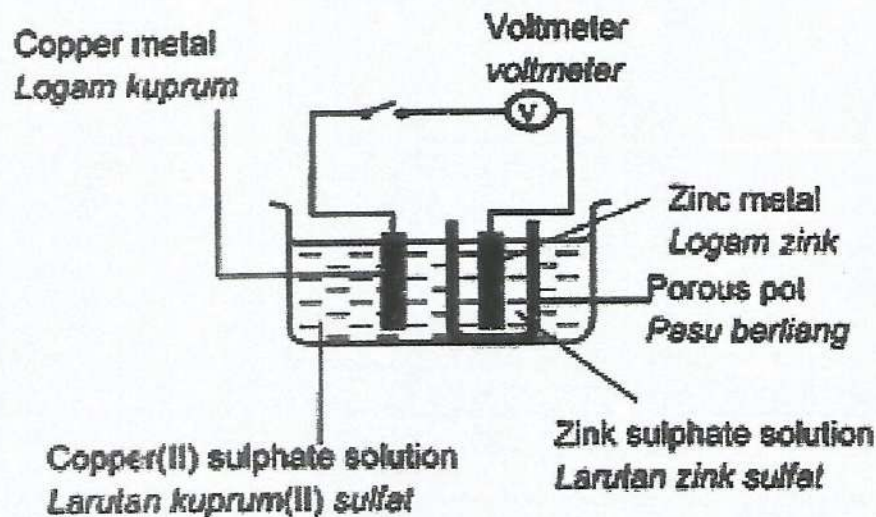


Diagram / Rajah 7

Which of the following statements are true about the above experiment?  
*Pernyataan manakah benar tentang eksperimen di atas?*

- I. Copper metal becomes thinner  
*Logam kuprum semakin menipis*
  - II. Zinc metal becomes thinner  
*Logam zink semakin menipis*
  - III. Blue color of copper(II) sulphate solution is fading  
*Warna biru larutan kuprum(II) sulfat semakin pudar*
  - IV. Brown deposit formed at zinc electrode  
*Enapan perang terbentuk di elektrod zink*
- A. I and II  
*I dan II*
  - B. I and IV  
*I dan IV*
  - C. II and III  
*II dan III*
  - D. III and IV  
*III dan IV*

32 Diagram 8 shows the arrangement of particles in three state of matter at room temperature.

Rajah 8 menunjukkan susunan zarah dalam tiga keadaan jirim pada suhu bilik.

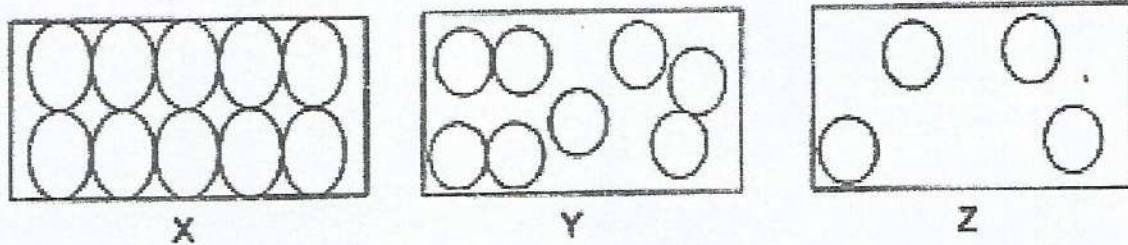


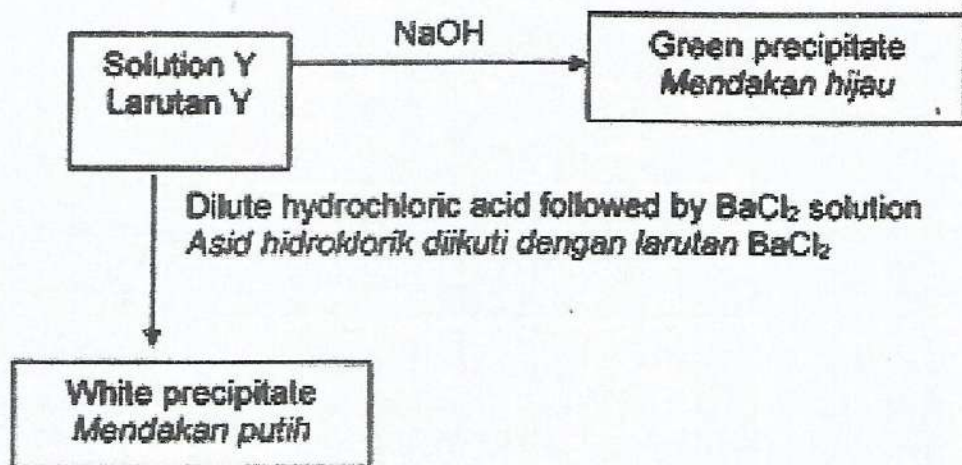
Diagram / Rajah 8

What are substances X, Y and Z at room temperature?  
Apakah bahan X, Y dan Z pada suhu bilik?

|   | X                        | Y                        | Z                        |
|---|--------------------------|--------------------------|--------------------------|
| A | Bromine<br>Bromin        | Naphthalene<br>Naftalena | Nitrogen<br>Nitrogen     |
| B | Naphthalene<br>Naftalena | Bromine<br>Bromin        | Nitrogen<br>Nitrogen     |
| C | Nitrogen<br>Nitrogen     | Bromine<br>Bromin        | Naphthalene<br>Naftalena |
| D | Naphthalene<br>Naftalena | Nitrogen<br>Nitrogen     | Bromine<br>Bromin        |



- 33 Diagram 9 shows a series of tests carried out on solution Y.  
Rajah 9 menunjukkan satu siri ujian telah dijalankan ke atas larutan Y.

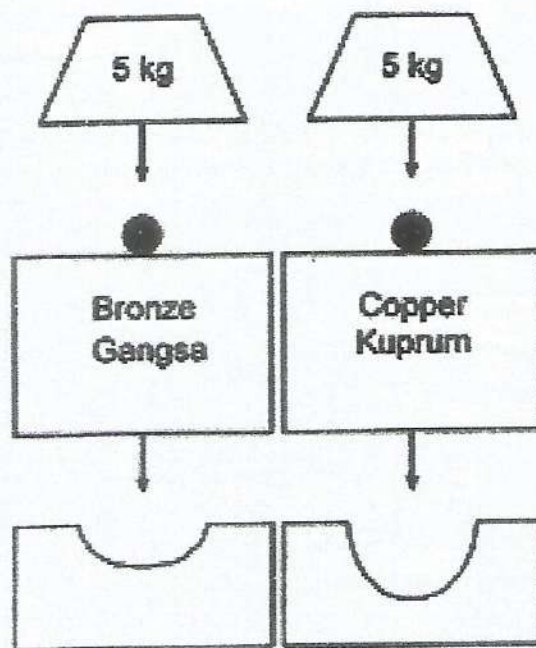


Diagram/ Rajah 9

Which of the following is most likely to be solution Y.  
Antara berikut manakah kemungkinan larutan Y.

- A Iron(II) sulphate  
Ferum(II) sulfat
- B Lead(II) sulphate  
Plumbum(II) sulfat
- C Iron(II) chloride  
Ferum(II) klorida
- D Copper(II) carbonate  
Kuprum(II) karbonat

- 34 Diagram 10 below shows the effect of a weight that is dropped onto steel ball bearing placed on bronze and copper blocks.  
*Rajah 10 di bawah menunjukkan kesan satu pemberat dijatuhkan ke atas bebola keluli yang terletak di atas bongkah gangsa dan kuprum.*



After the impact      After the impact  
*Selepas hentaman      Selepas hentaman*

Diagram/ *Rajah* 10

What is the characteristic shown by the bronze block?  
*Apakah sifat yang ditunjukkan oleh bongkah gangsa?*

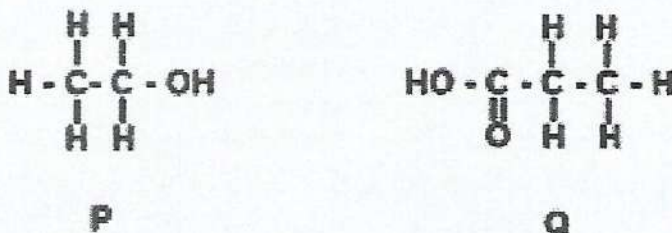
- A Shiny  
*Berkilau*
- B Light  
*Ringan*
- C Strong and hard  
*Kuat dan keras*
- D Able to withstand corrosion  
*Boleh menahan kakisan*



35 0.2 mol of magnesium tape reacts with excess dilute nitric acid. After 30 seconds 0.05 mol of magnesium remains as residue. What is the average rate of reaction?  
 0.2 mol pita magnesium bertindak balas dengan asid nitrik cair berlebihan. Setelah 30 saat, didapati 0.05 mol magnesium tertinggal sebagai baki. Berapakah kadar tindak balas purata itu?

- A  $1.7 \times 10^{-3} \text{ mol s}^{-1}$   
 B  $1.5 \times 10^{-3} \text{ mol s}^{-1}$   
 C  $2.3 \times 10^{-3} \text{ mol s}^{-1}$   
 D  $5.0 \times 10^{-3} \text{ mol s}^{-1}$

36 Diagram 11 below are the structural formulae which represent organic compounds P and Q.  
 Rajah 11 di bawah menunjukkan formula struktur yang mewakili sebatian organik P dan Q.



Diagram/ Rajah 11

What is the name of the compound formed when compound P reacts with compound Q using concentrated sulphuric acid as a catalyst?

Apakah nama sebatian yang terhasil apabila sebatian P bertindak balas dengan sebatian Q dengan menggunakan asid sulfurik pekat sebagai mangkin?

- A Butyl ethanoate  
 Butil etanoat  
 B Ethyl butanoate  
 Etil butanoat  
 C Propyl ethanoate  
 Propil etanoat  
 D Ethyl propanoate  
 Etil propanoat

- 37 Magnesium react with hydrochloric acid, state the process happen to magnesium and hydrogen ion?  
 Magnesium bertindak balas dengan asid hidroklorik, nyatakan proses yang berlaku kepada magnesium dan ion hidrogen?

|   | Magnesium<br>Magnesium    | Hydrogen ion<br>Ion hidrogen |
|---|---------------------------|------------------------------|
| A | Oxidation<br>Pengoksidaan | Reduction<br>Penurunan       |
| B | Reduction<br>Penurunan    | Oxidation<br>Pengoksidaan    |
| C | Oxidation<br>Pengoksidaan | Oxidation<br>Pengoksidaan    |
| D | Reduction<br>Penurunan    | Reduction<br>Penurunan       |

- 38 A student wants to study the heat of displacement by using lead metal. Which of the solutions are suitable to be use in this experiment?  
 Seorang pelajar ingin mengkaji haba penyesaran menggunakan logam plumbum. Yang manakah larutan yang sesuai digunakan dalam eksperimen ini?

- I Zinc nitrate  
Zink nitrat
  - II Copper (II) nitrate  
Kuprum(II) nitrat
  - III Silver nitrate  
Argentum nitrat
  - IV Magnesium nitrate  
Magnesium nitrat
- A I and III  
I dan III
  - B I and IV  
I dan IV
  - C II and III  
II dan III
  - D II and IV  
II dan IV



- 39 Diagram 12 shows a child having fever. Her mother takes him to a doctor. What medicine the doctor prescribed to the child?

*Rajah 12 menunjukkan seorang kanak-kanak yang demam.*

*Ibunya membawa kanak-kanak itu berjumpa doktor. Apakah ubat yang doktor akan preskripsi kepada kanak-kanak itu?*



Diagram/ Rajah 12

- A Aspirin  
*Aspirin*
- B Barbiturate  
*Barbiturat*
- C Penicillin  
*Penisilin*
- D Paracetamol  
*Parasetamol*
- 40 Every morning, Muthu helped his father to collect latex from the rubber tree. He found that the latex coagulated after a few hours. How muthu can prevent the latex from coagulating?  
*Setiap pagi, Muthu menolong ayahnya mengumpul latek dari pokok getah. Dia mendapati latek mengumpal selepas beberapa jam. Bagaimanakah Muthu dapat mengelakan latek daripada mengumpal?*
- A Add ammonia solution  
*Tambah larutan ammonia*
- B Add sodium chloride solution  
*Tambah larutan natrium klorida*
- C Add ethanoic acid  
*Tambah asid etanoik*
- D Add sulphur monochloride  
*Tambah sulfur monoklorida*

- 41 1.2 g of element X reacted with 8 g of element Y to form a compound with the formula  $XY_2$ . What is the relative atomic mass of element X ?  
[ Relative atomic mass of Y = 80 ]

1.2 g unsur X bertindak balas dengan 8 g unsur Y untuk membentuk sebatian yang mempunyai formula  $XY_2$ . Berapakah jisim atom relatif bagi unsur X ?  
[ Jisim atom relatif Y = 80 ]

- A 9  
B 12  
C 24  
D 40
- 42 Table 4 shows the number of neutron and nucleon number of atom X and atom Y.  
Jadual 4 menunjukkan bilangan neutron dan nombor nukleon bagi atom X dan atom Y.

| Atom | Number of neutron<br>Bilangan neutron | Nucleon number<br>Nombor nukleon |
|------|---------------------------------------|----------------------------------|
| X    | 12                                    | 24                               |
| Y    | 8                                     | 16                               |

Table/Jadual 4

Which of the following, the properties of compound produced when X react with Y.  
Antara berikut, yang manakah ciri-ciri sebatian yang terbentuk apabila X bertindak balas dengan Y?

- A Can conduct electricity in all state  
Boleh mengkonduksikan elektrik dalam semua keadaan
- B Soluble in water  
Larut di dalam air
- C React with alkali  
Bertindak balas dengan alkali
- D Produce more sootiness when burn in air  
Menghasilkan lebih banyak jelaga apabila terbakar dalam udara



- 43 Diagram 13 show the electron arrangement of compound Q produced when atom P react with atom R.

Rajah 13 menunjukkan susunan elektron bagi sebatian Q yang terbentuk apabila atom P bertindak balas dengan atom R.

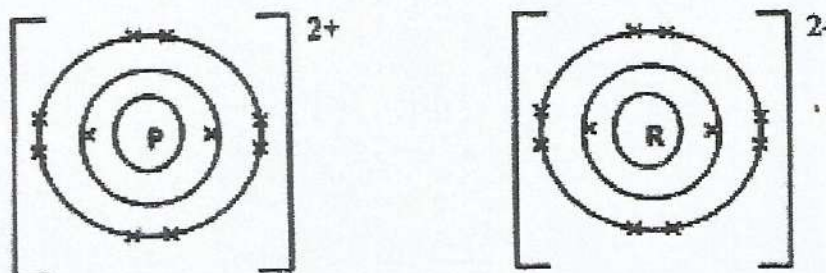


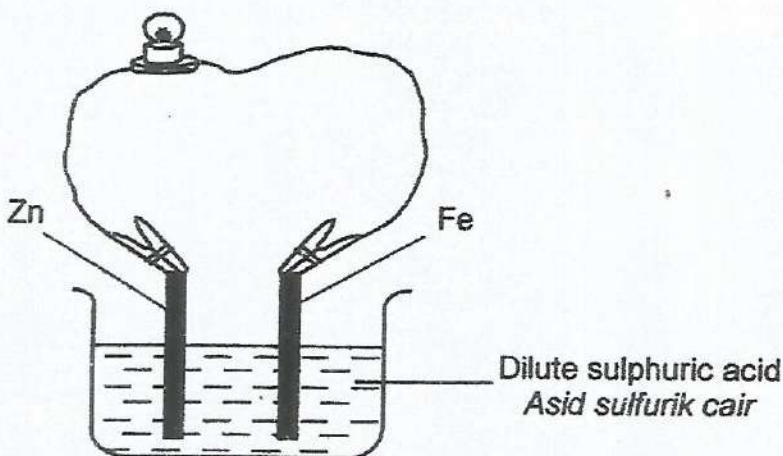
Diagram / Rajah 13

Which of the following are the position of element P and element R in the periodic table or elements?

Antara berikut, yang manakah kedudukan unsur P dan unsur R dalam jadual berkala unsur?

|   | P                                    | R                                    |
|---|--------------------------------------|--------------------------------------|
| A | Group/ Kumpulan 2<br>Period/ kala 2  | Group / Kumpulan 2<br>Period/ kala 3 |
| B | Group/ Kumpulan 18<br>Period/ kala 2 | Group/ Kumpulan 18<br>Period/ kala 2 |
| C | Group/ Kumpulan 2<br>Period/ kala 3  | Group/ Kumpulan 16<br>Period/ kala 2 |
| D | Group/ Kumpulan 16<br>Period/ kala 2 | Group/ Kumpulan 16<br>Period/ kala 2 |

- 44 Diagram 14 show an apparatus set-up a chemical cell.  
Rajah 14 menunjukkan susunan radas bagi sel kimia.



Diagram/ Rajah 14

What modification should be done to make the bulb shine most brightly?  
Apakah pengubahsuaian yang perlu dilakukan supaya nyalaan mentol lebih terang?

- A Substitute dilute sulphuric acid with copper(II) sulphate solution  
Menggantikan asid sulfurik cair dengan larutan kuprum(II) sulfat
- B Used a thick and wider metal plate  
Menggunakan kepingan logam yang tebal dan lebar
- C Substitute ferum plate with aluminium plate  
Menggantikan kepingan besi dengan kepingan aluminium
- D Substitute ferum plate with copper plate  
Menggantikan kepingan besi dengan kepingan kuprum
- 45 The following equation shows the reaction between sulphuric acid and potassium hydroxide.  
Persamaan berikut menunjukkan tindak balas antara asid sulfurik dan kalium hidroksida.



What is the volume of  $0.5 \text{ mol dm}^{-3}$  potassium hydroxide solution which can neutralise  $50.0 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$  sulphuric acid?

Berapakah isipadu larutan kalium hidroksida  $0.5 \text{ mol dm}^{-3}$  yang boleh meneutralkan  $50.0 \text{ cm}^3$  asid sulfurik  $0.5 \text{ mol dm}^{-3}$ ?

- A  $25.0 \text{ cm}^3$
- B  $50.0 \text{ cm}^3$
- C  $100.0 \text{ cm}^3$
- D  $400.0 \text{ cm}^3$



46 Which of the following pairs of substances is most suitable for the preparation of copper(II) sulphate?

*Antara pasangan bahan berikut yang manakah paling sesuai digunakan untuk menyediakan kuprum(II) sulfat?*

- A Dilute sulphuric acid, copper(II) carbonate  
*Asid sulfurik cair, kuprum(II) karbonat*
- B Ammonium sulphate, copper(II) oxide  
*Ammonium sulfat, kuprum(II) oksida*
- C Dilute sulphuric acid, copper powder  
*Asid sulfurik cair, serbuk kuprum*
- D Aqueous sodium sulphate, aqueous copper(II) nitrate  
*Larutan natrium sulfat, larutan kuprum(II) nitrat*

47 When 1.48 g of butanol,  $C_4H_9OH$  was burnt in excess oxygen, the heat liberated caused the temperature of 500  $cm^3$  of water to rise from 28  $^{\circ}C$  to 53.5  $^{\circ}C$ . What is the heat of combustion of butanol?

*[Relative molecular mass of butanol = 74, specific heat capacity = 4.2  $J g^{-1} ^{\circ}C^{-1}$ ]*

*Apabila 1.48 g butanol,  $C_4H_9OH$  terbakar dalam oksigen berlebihan, haba yang terhasil meningkatkan suhu 500  $cm^3$  air daripada 28  $^{\circ}C$  ke 53.5  $^{\circ}C$ . Apakah haba pembakaran bagi butanol?*

*[Jisim molekul relatif bagi butanol = 74, haba muatan tentu = 4.2  $J g^{-1} ^{\circ}C^{-1}$ ]*

- A 53.55  $kJ mol^{-1}$
- B 2677.50  $kJ mol^{-1}$
- C 2940.00  $kJ mol^{-1}$
- D 7925.40  $kJ mol^{-1}$

- 48 Table 5 show the volume of hydrogen gas collected in an experiment when zinc powder reacts with excess dilute hydrochloric acid.  
 Jadual 5 menunjukkan isipadu gas hidrogen terkumpul dalam satu eksperimen apabila serbuk zink bertindak balas dengan asid hidroklorik cecair.

|  |     |      |      |      |      |      |
|--|-----|------|------|------|------|------|
| Time (min)<br>Masa (min)   | 0   | 1    | 2    | 3    | 4    | 5    |
| Volume of hydrogen gas (cm <sup>3</sup> )<br>Isipadu gas hidrogen (cm <sup>3</sup> ) | 0.0 | 30.0 | 32.0 | 32.5 | 33.0 | 33.0 |

Table/ Jadual 5

What is the average rate of reaction?  
 Berapakah kadar tindak balas purata?

- A 0.11 cm<sup>3</sup> s<sup>-1</sup>  
 B 0.14 cm<sup>3</sup> s<sup>-1</sup>  
 C 0.66 cm<sup>3</sup> s<sup>-1</sup>  
 D 0.75 cm<sup>3</sup> s<sup>-1</sup>
- 49 The decomposition of lead(II) nitrate produces lead(II) oxide, oxygen and a brown gas.  
 Which of the following is the balanced chemical equation for the reaction?  
 Penguraian plumbum(II) nitrat menghasilkan plumbum(II) oksida, oksigen dan gas berwarna perang. Antara berikut, yang manakah persamaan kimia seimbang bagi tindak balas berikut?

- A  $\text{Pb}(\text{NO}_3)_2 \longrightarrow \text{PbO} + \text{NO}_2 + \text{O}_2$   
 B  $2\text{Pb}(\text{NO}_3)_2 + \text{O}_2 \longrightarrow 2\text{PbO} + 3\text{NO}_2 + \text{O}_2$   
 C  $2\text{Pb}(\text{NO}_3)_2 \longrightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$   
 D  $\text{Pb}(\text{NO}_3)_2 + \text{O}_2 \longrightarrow \text{PbO} + \text{NO}_2 + \frac{5}{2}\text{O}_2$



- 50 Diagram 15 shows the apparatus set-up used to investigate the reaction of iron(III) nitrate solution with potassium iodide solution.  
*Rajah 15 menunjukkan susunan radas yang digunakan untuk mengkaji tindak balas antara larutan ferum(III) nitrat dengan larutan kalium iodida.*

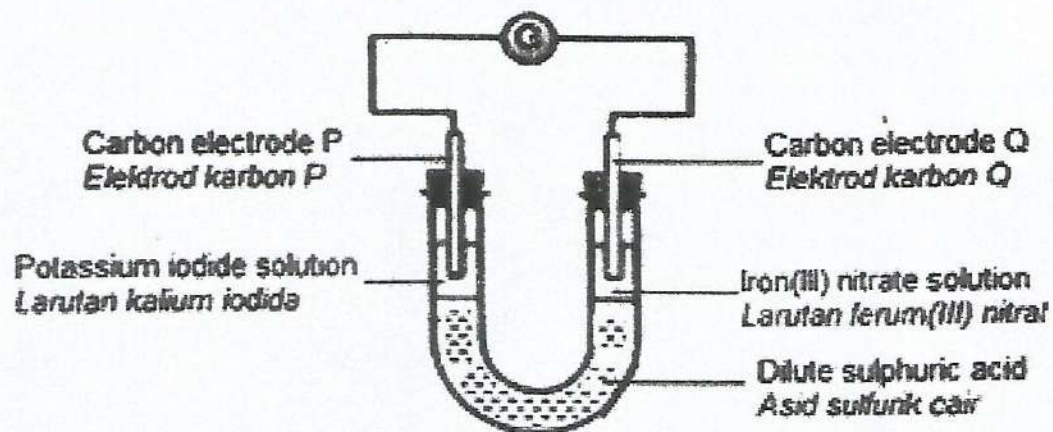


Diagram / Rajah 15

Which is the correct observation for the two solutions?  
*Pemerhatian yang manakah betul untuk kedua-dua larutan?*

|   | Potassium iodide solution<br><i>Larutan kalium iodida</i>  | Iron(III) nitrate solution<br><i>Larutan Ferum(III) nitrat</i> |
|---|--|--|
| A | Colourless to brown<br><i>Tidak berwarna kepada perang</i> | Brown to green<br><i>Perang kepada hijau</i>                   |
| B | Green to brown<br><i>Hijau kepada perang</i>               | Purple to colourless<br><i>Ungu kepada tidak berwarna</i>      |
| C | Colourless to brown<br><i>Tidak berwarna kepada perang</i> | Green to brown<br><i>Hijau kepada perang</i>                   |
| D | Green to brown<br><i>Hijau kepada perang</i>               | Orange to green<br><i>Jingga kepada hijau</i>                  |

END OF QUESTIONS  
 SOALAN TAMAT

