

SULIT
4541/1
Kimia
Kertas 1
1 ¼ jam

4541/1

September
2009



JABATAN PELAJARAN SELANGOR

PROGRAM PENINGKATAN PRESTASI SAINS DAN MATEMATIK

2009

KIMIA

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas ini adalah dalam dwibahasa.*
2. *Jawab semua soalan.*
3. *Catatan dikhendaki membaca maklumat di halaman 2 dan 3*

Kertas ini mengandungi 22 halaman bercetak.

[Lihat sebelah...
SULIT

INFORMATION FOR CANDIDATES

1. *This question paper consists of 50 questions.*
2. *Answer all questions.*
3. *Answer each question by blackening the correct space on the answer sheet.*
4. *Blacken only one space for each question.*
5. *If you wish to change your answer, erase the blackened mark that you have made. Then blacken the space for the new answer.*
6. *The diagrams in the questions provided are not drawn to scale unless stated.*
7. *You may use a non-programmable scientific calculator.*

MAKLUMAT UNTUK CALON

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab semua soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Hitamkan satu ruangan sahaja bagi setiap soalan.*
5. *Sekiranya anda hendak menukar jawapan, padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru.*
6. *Rajah yang mengiringi soalan tidak dihitamkan mengikut skala kecuali dinyatakan.*
7. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*

1. Which of the following compounds is an example of a soluble salt?
Antara sebatian berikut, yang manakah merupakan garam terlarutkan?
- A Magnesium carbonate [*Magnesium karbonat*]
B Lead(II) nitrate [*Plumbum(II) nitrat*]
C Silver chloride [*Argentum klorida*]
D Barium sulphate [*Barium sulfat*]
2. Which of the following is a characteristic the particles in an electrolyte?
Pernyataan yang manakah adalah sifat zarah-zarah dalam elektrolit?
- A An electrolyte consists of free moving atoms in the aqueous state
Elektrolit terdiri daripada atom-atom yang bergerak bebas dalam keadaan akueus
B An electrolyte consists of free moving ions in only in the aqueous state
Elektrolit terdiri daripada ion-ion yang bergerak bebas dalam keadaan akueus sahaja
C An electrolyte consists of free moving ions only in the molten state
Elektrolit terdiri daripada ion-ion yang bergerak bebas dalam keadaan leburan sahaja
D An electrolyte consists of free moving ions in the molten and aqueous state
Elektrolit terdiri daripada ion-ion bergerak bebas dalam keadaan leburan dan akueus
3. The pH values of three acid solutions of 0.1 mol dm^{-3} are shown in Table 1
Nilai pH tiga larutan asid 0.1 mol dm^{-3} ditunjukkan dalam Jadual 1

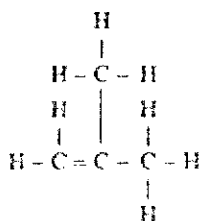
Solution [Larutan]	pH value [nilai pH]
X	3.2
Y	1.0
Z	5.0

Table 1
Jadual 1

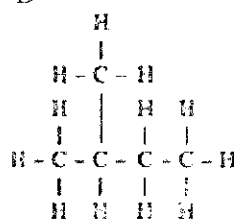
Arrange the acids according to ascending order of the degree of dissociation.
Susunkan asid-asid itu dalam turutan menaik berdasarkan darjah penceraian.

- A X, Y, Z
B X, Z, Y
C Z, X, Y
D Y, X, Z
4. Which of these organic compounds decolourises bromine water?
Yang manakah sebatian organik berikut menyahwarnakan air bromin.

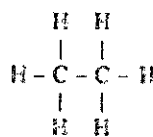
A



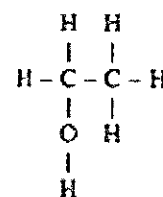
B



C



D

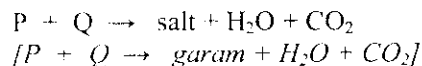


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Dapatkan skema Jawapan di Laman

5. The chemical equation below shows the reaction between P and Q.
Persamaan kimia di bawah menunjukkan tindak balas di antara P dan Q.



Which of the following pairs could be P and Q?
Yang manakah pasangan berikut mungkin P dan Q?

- A Zinc and hydrochloric acid [*Zink dan asid hidroklorik*]
 B Sodium carbonate and sulphuric acid [*Natrium karbonat dan asid sulfurik*]
 C Magnesium carbonate and sodium hydroxide [*Magnesium karbonat dan natrium hidroksida*]
 D Lead(II) oxide and nitric acid [*Plumbum(II) oksida dan asid nitrik*]
6. Diagram 1 shows the structural formula of PVC.
Rajah 1 menunjukkan formula struktur bagi PVC.

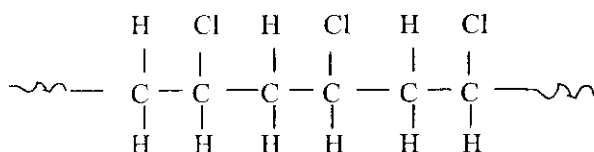
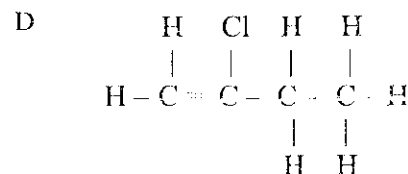
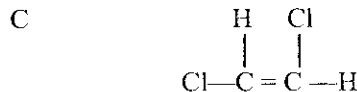
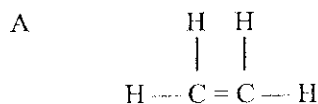


Diagram 1
Rajah 1

What is the structural formula of its monomer?
Apakah formula struktur bagi monomernya?



7. Acidified potassium manganate(VII) is added to ethene in a test tube. What is the molecular formula of the substance formed?
Kalium manganat(VII) berasid ditambahkan kepada etena dalam sebuah tabung uji. Apakah formula molekul bahan yang terhasil?

- A C_2H_6
 B CH_3COOH
 C $\text{C}_2\text{H}_5\text{OH}$
 D $\text{C}_2\text{H}_4(\text{OH})_2$

8. Diagram 2 shows the graph of temperature against time when solid X is heated.
Rajah 2 menunjukkan graf suhu melawan masa apabila pepejal X dipanaskan.

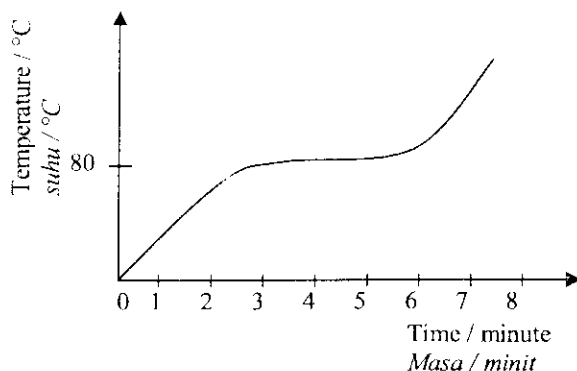
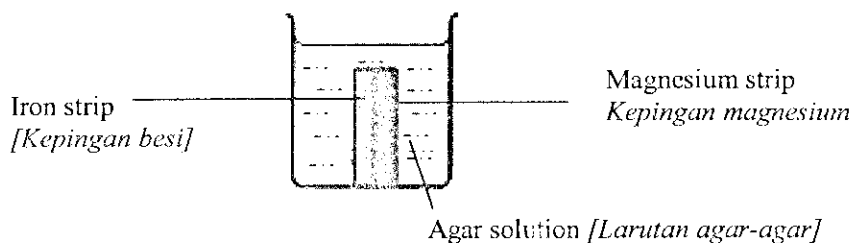


Diagram 2
Rajah 2

Which of the following is **true** during the fourth minute?
Yang manakah adalah **benar** pada minit yang ke empat?

- A All the molecules are in random motion.
Semua molekul bergerak secara rawak.
- B All the molecules are closely packed and in random motion.
Semua molekul tersusun rapat dan bergerak secara rawak.
- C All the molecules are moving at fixed positions.
Semua molekul bergerak pada kedudukan yang tetap.
- D Some of the molecules are moving at fixed positions but some are in random motion.
Sebahagian molekul bergerak pada kedudukan tetap tetapi sebahagian bergerak secara rawak.
9. Which of the following is **not** a property of methanoic acid?
Di antara berikut yang manakah **bukan** sifat asid metanoik?
- A Low melting point [takat lebur rendah]
- B Colourless liquid [cecair tak berwarna]
- C Insoluble in water [Tidak larut dalam air]
- D Reacts with a metal carbonate [Bertindak balas dengan suatu karbonat logam]
10. Ethane and propane are hydrocarbon compounds from the same homologous series.
Which statement is true for both ethane and propane?
Etana dan propana adalah sebatian hidrokarbon dari siri homolog yang sama.
Pernyataan yang manakah benar bagi kedua-dua etana dan propana?
- A Soluble in water [Larut dalam air]
- B Undergo substitution reaction [Menjalani tindak balas penukargantian]
- C Undergo addition reaction [Menjalani tindak balas penambahan]
- D Have the same physical properties [Mempunyai sifat fizik yang sama]

11. Optical fibre is a type of composite materials. Which of the following is the usage of optical fibre?
Gentian optik ialah sejenis bahan komposit. Yang manakah antara berikut adalah kegunaan gentian optik ?
- A As a heat insulator [*Sebagai penebat haba*]
 - B To transmit signals in telecommunication [*Untuk menghantar isyarat dalam telekomunikasi*]
 - C As the internal surface lining of furnace [*Sebagai lapisan dalam relau*]
 - D As an additive in synthetic polymers [*Sebagai bahan tambah dalam polimer sintetik*]
12. Which of the following substances is a reducing agent ?
Antara bahan berikut, yang manakah adalah agen penurunan ?
- A Bromine water [*Air bromin*]
 - B Iron(III) sulphate solution [*Larutan ferum(III) sulfat*]
 - C Potassium iodide solution [*Larutan kalium iodida*]
 - D Acidified potassium dichromate(VI) solution [*Larutan kalium dikromat(VI) berasid*]
13. Diagram 3 below shows the set up of apparatus for a chemical reaction.
Rajah 3 menunjukkan susunan radas bagi satu tindak balas kimia.



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

- A Iron is reduced [*Ferum diturunkan*]
- B Iron is an oxidising agent [*Ferum adalah agen pengoksidaan*]
- C Magnesium releases electron [*Magnesium membebaskan elektron*]
- D Oxidation number of magnesium decreases [*Nombor pengoksidaan magnesium berkurang*]

14. Table 1 shows the position of two elements, P and Q, in the Periodic Table of Elements.
Jadual 1 menunjukkan kedudukan dua unsur, P dan Q di dalam Jadual Berkala Unsur

Elements	Group	Period
P	1	3
Q	17	3

Table 1 [Jadual 1]

Which of the following statements about elements P and Q is true?
Pernyataan yang manakah antara berikut benar tentang unsur P dan Q?

- A Atom P is smaller than atom Q
Atom P lebih kecil daripada atom Q
- B Atom P has a stronger attraction towards electrons than atom Q
Atom P mempunyai tarikan terhadap elektron yang lebih kuat daripada Q
- C The positive charge in the nucleus of atom P is less than that in atom Q
Cas positif dalam nukleus atom P kurang daripada yang di dalam atom Q
- D Atom Q has a higher tendency to release electrons than atom P
Atom Q lebih cenderung melepaskan elektron daripada atom P
15. Diagram 4 shows two bottles of aqueous solutions.
Rajah 4 menunjukkan dua botol larutan akueus.

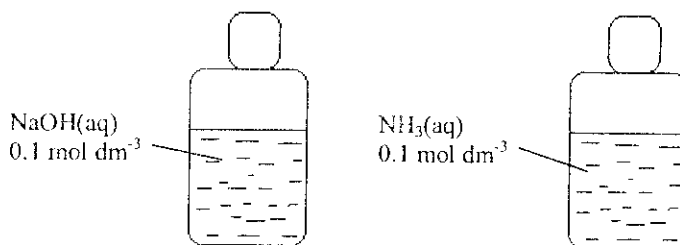


Diagram 4
 [Rajah 4]

Which of the following is true for both solutions?
Yang manakah antara berikut benar bagi kedua-dua larutan?

- A Both are strong alkalis [Kedua-dua adalah alkali kuat]
- B Both have the same pH value [Kedua-dua mempunyai nilai pH yang sama]
- C Both are electrolytes [Kedua-dua adalah elektrolit]
- D Both can change blue litmus paper to red
[Kedua-dua boleh memukarkan kertas litmus biru ke merah]
16. Which of the following statements about a weak alkali is true?
Pernyataan yang manakah antara berikut benar tentang alkali lemah?
- A The pH value is less than 7 [Nilai pH kurang daripada 7]
- B Do not neutralise acid [Tidak boleh meneutralkan asid]
- C Change blue litmus paper to red [Memukarkan kertas litmus biru ke merah]
- D Ionizes partially in water to produce hydroxide ions. [Mengion separa dalam air menghasilkan ion hidroksida]

17. Which of the following reactions is a redox reaction?

Yang manakah antara berikut merupakan tindak balas redoks?

- A Corrosion [*Kakisan*]
- B Neutralization [*Peneutralan*]
- C Halogenation [*Penghalogenan*]
- D Saponification [*Saponifikasi*]

18. Which of the following factors can affect the rate of a reaction ?

Yang manakah antara faktor-faktor berikut akan mempengaruhi kadar suatu tindak balas?

- I The temperature of the reactants [*Suhu bahan tindak balas*]
 - II The size of the container [*Saiz bekas*]
 - III The use of a catalyst [*Penggunaan mangkin*]
 - IV The number of moles of reactants [*Bilangan mol bahan tindak balas*]
- A I and III [*I dan III*]
 - B I and IV [*I dan IV*]
 - C II and III [*II dan III*]
 - D III and IV [*III dan IV*]

19.

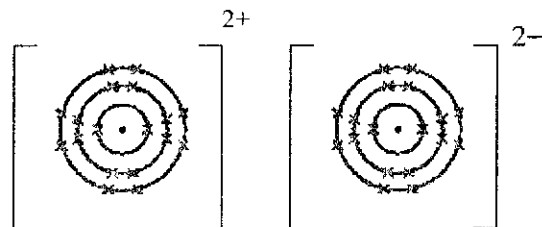


Diagram 5
Rajah 5

Diagram 5 shows the electron arrangement of a compound formed from two different elements. Which of the following properties is true of this compound?

Rajah 5 menunjukkan susunan elektron satu sebatian yang terbentuk daripada dua unsur yang berlainan. Yang mana sifat berikut adalah benar untuk sebatian tersebut?

- A It has a low melting point [*Ia mempunyai takat lebur yang rendah*]
- B It is soluble in organic solvents [*Ia boleh melarut dalam pelarut organik*]
- C It conducts electricity in the solid state [*Ia mengkonduksi elektrik dalam keadaan pepejal*]
- D It conducts electricity in the molten state [*Ia mengkonduksi elektrik dalam keadaan leburan*]

20. Metals are arranged at specific positions in the electrochemical series. Which of the following statements are true of a metal at a higher position in the electrochemical series compared to a metal at a lower position ?

Logam-logam disusun mengikut kedudukan yang tertentu dalam siri elektrokimia. Yang manakah antara kenyataan berikut benar tentang suatu logam yang terletak pada kedudukan yang lebih tinggi dalam siri elektrokimia berbanding dengan suatu logam yang lebih rendah daripadanya ?

- I It is more stable [*ia adalah lebih stabil*]
 - II It is more electropositive [*ia adalah lebih elektropositif*]
 - III It is easier to ionise [*ia adalah lebih senang mengion*]
 - IV It is a stronger reducing agent. [*ia adalah agen penurunan yang lebih kuat*]
- A I and II [*I dan II*]
 - B III and IV [*III dan IV*]
 - C II, III and IV [*II, III dan IV*]
 - D I, II, III and IV [*I, II, III dan IV*]

21.

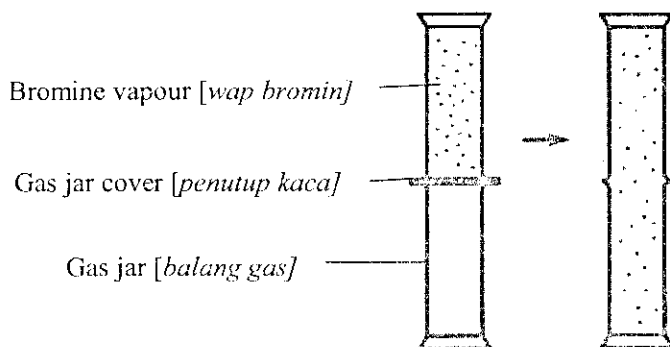


Diagram 6 [*Rajah 6*]

Diagram 6 shows the set up of the apparatus of an experiment. When the gas jar cover was removed, it was found that the gas jar below was filled with the brown bromine gas. What is the inference of this experiment?

Rajah 6 menunjukkan susunan radas bagi suatu eksperimen. Apabila penutup kaca dikeluarkan, didapati balang gas di atas dipenuhi dengan gas bromin yang berwarna perang. Apakah inferens untuk eksperimen ini?

- A Bromine gas consists of discrete molecules in motion. [*Gas bromin terdiri molekul diskrit yang bergerak.*]
- B Bromine gas move down due to gravitational forces. [*Gas bromin bergerak ke bawah disebabkan oleh daya tarikan gravity.*]
- C Diffusion has taken place because bromine gas is heavier than air. [*Resapan berlaku kerana gas bromin lebih berat daripada udara.*]
- D The force of attraction between bromine molecules decreases in diffusion. [*Daya tarikan antara molekul bromin berkurang dalam resapan.*]

22. Which factor will **not** affect the rate of reaction between dilute hydrochloric acid and zinc?
Faktor yang manakah tidak mempengaruhi kadar tindak balas antara asid hidroklorik cair dan logam zink?
- A The mass of zinc used [*Jisim zink yang digunakan*]
 - B The concentration of hydrochloric acid used [*Kepekatan asid hidroklorik yang digunakan*]
 - C The volume of hydrochloric acid used [*Isipadu asid hidroklorik yang digunakan*]
 - D The addition of copper (II) sulphate solution [*Penambahan larutan kuprum (II) sulfat*]
23. Which of the following properties can be predicted based on the position of the element in the Periodic Table of Elements?
Yang manakah antara sifat berikut boleh diramalkan berdasarkan kedudukan unsur dalam Jadual Berkala Unsur?
- A The number of neutrons in an atom of the element [*Bilangan neutron dalam suatu atom unsur itu.*]
 - B The number of isotopes the element has [*Bilangan isotop yang dipunyai oleh unsur itu*]
 - C The charge of the ion formed by the element [*Cas ion yang terbentuk oleh unsur itu*]
 - D The relative atomic mass of the element [*Jisim atom relatif unsur itu*]
24. Which of the following statements is true for an ionic compound with an ionic formula of XY_2 ?
Manakah pernyataan berikut benar tentang satu sebatian ion dengan formula ion XY_2 ?
- A An atom of X has 2 valence electrons while an atom of Y has 7 valence electrons.
[Satu atom X mempunyai 2 elektron valens manakala satu atom Y mempunyai 7 elektron valens]
 - B One atom of Y donates two electrons to an atom of X.
[Satu atom Y menderma dua elektron kepada satu atom X]
 - C X is from Group 14 and Y is from Group 16 of the Periodic Table of elements.
[X adalah dari Kumpulan 14 dan Y adalah dari Kumpulan 16 dalam Jadual Berkala unsur]
 - D One atom of Y shares two electrons with one atom of X.
[Satu atom Y berkongsi dua elektron dengan satu atom X]

25. Diagram 7 shows the set-up of the apparatus of a chemical cell.

Rajah 7 menunjukkan susunan radas sebuah sel kimia

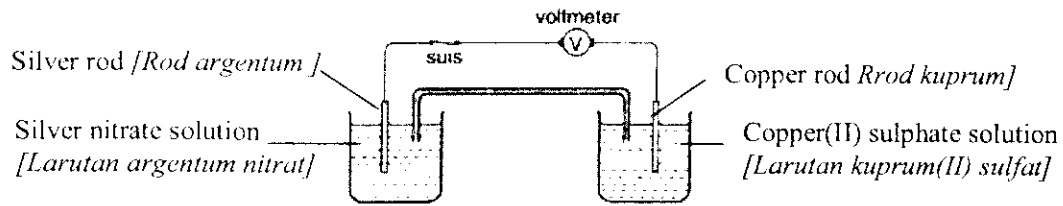


Diagram 7 [Rajah 7]

Which of the following observations is true in the chemical cell?

Antara pemerhatian berikut yang manakah benar dalam sel kimia itu?

- A The copper rod becomes thicker [Rod kuprum menjadi lebih tebal]
 - B The silver rod becomes thinner [Rod argentum menjadi lebih nipis]
 - C Silver nitrate solution becomes blue. [Larutan argentum nitrat menjadi biru]
 - D The blue intensity of copper(II) sulphate solution increases. [keamatan warna biru larutan kuprum(II) sulfat bertambah]
26. Diagram 8 shows the set-up of the apparatus to collect the gaseous products formed in the electrolysis of an aqueous solution of compound X using inert electrodes.

Rajah 8 menunjukkan susunan radas untuk mengutipkan hasil gas yang terbentuk dalam elektrolisis suatu larutan akueus sebatian X dengan menggunakan elektrod lengai.

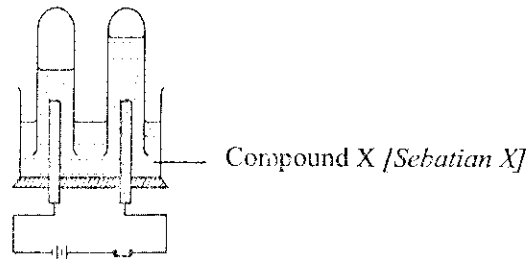


Diagram 8 [Rajah 8]

Which of the following compounds can be compound X?

Yang manakah antara berikut mungkin ialah sebatian X?

- A 2.0 mol dm^{-3} copper(II) chloride solution [larutan kuprum(II) klorida 2.0 mol dm^{-3}]
- B 2.0 mol dm^{-3} sodium chloride solution [larutan natrium klorida 2.0 mol dm^{-3}]
- C 2.0 mol dm^{-3} copper(II) sulphate solution [larutan kuprum(II) sulfat 2.0 mol dm^{-3}]
- D 2.0 mol dm^{-3} silver nitrate solution [larutan argentum nitrat 2.0 mol dm^{-3}]

27. Diagram 9 shows the set-up of the apparatus in a chemical cell and an electrolytic cell.
Rajah 9 menunjukkan susunan radas dalam satu sel kimia dan sel elektrolitik.

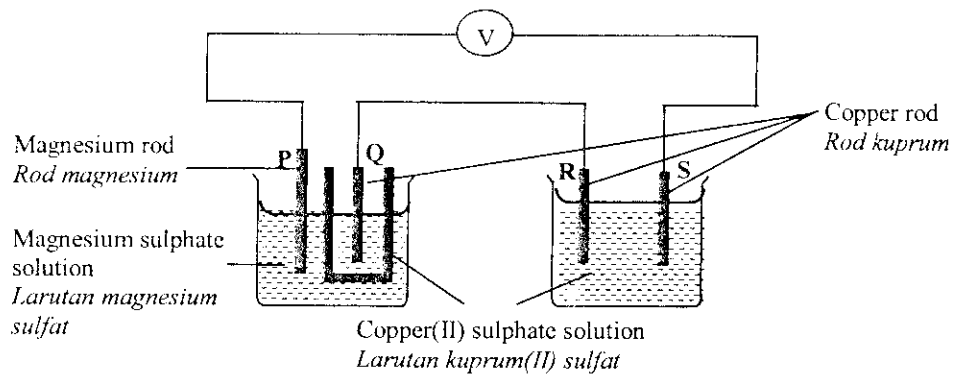


Diagram 9 [Rajah 9]

Which of the following is the expected observation at electrode R?

Yang manakah antara berikut adalah pemerhatian yang dijangka pada elektrod R?

- A Electrode R becomes thinner [Elektrod R menjadi lebih nipis]
 - B Electrode R becomes thicker [Elektrod R menjadi lebih tebal]
 - C A colourless gas is liberated [Satu gas tanpa warna terbebas.]
 - D A colourless gas is released [Gas tak berwarna terbebas.]
28. Diagram 10 shows the set-up of the apparatus of a chemical cell. The voltmeter reading is 1.1V.
Rajah 10 menunjukkan susunan radas satu sel kimia. Bacaan voltmeter ialah 1.1V.

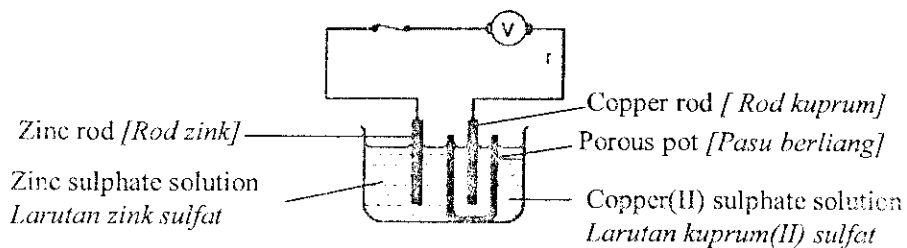


Diagram 10 [Rajah 10]

Which of the following will increase the voltmeter reading?

Yang manakah antara berikut akan menambah bacaan voltmeter?

- A Replace the zinc rod with iron rod
Gantkani rod zink dengan rod iron
- B Replace the copper rod with silver rod
Gantikan rod kuprum dengan rod argentum
- C Increase the concentration of the two solutions
Menambahkan kepekatan kedua-dua larutan
- D Replace the porous pot by a salt bridge
Gantikan pasu berliang dengan titian garam

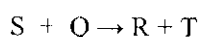
29. The electron arrangement of ion Q^- is 2.8.18.8. The proton number element W is 17. Which of the following statements is true?

Susunan elektron ion Q^- ialah 2.8.18.8. dan nombor proton unsur W ialah 17. Yang manakah antara pernyataan berikut adalah benar?

- A Element W is more electronegative than element Q
Unsur W lebih elektronegatif daripada unsur Q
- B Element W has a higher boiling point than element Q
Takat didih unsur W lebih tinggi daripada unsur Q
- C Solutions of Q and W in tetrachloromethane can conduct electricity
Larutan Q dan W dalam tetraklorometana boleh mengkonduksi elektrik.
- D Element W is denser than element Q
Unsur W lebih tumpat daripada unsur Q

30. A reaction is represented by the following equation :

Suatu tindakbalas diwakili oleh persamaan berikut::



This reaction can occur through two different paths, a and b as shown in the Diagram 11 below.

Tindak balas ini dapat berlaku melalui dua laluan berlainan, a dan b dalam Rajah 11.

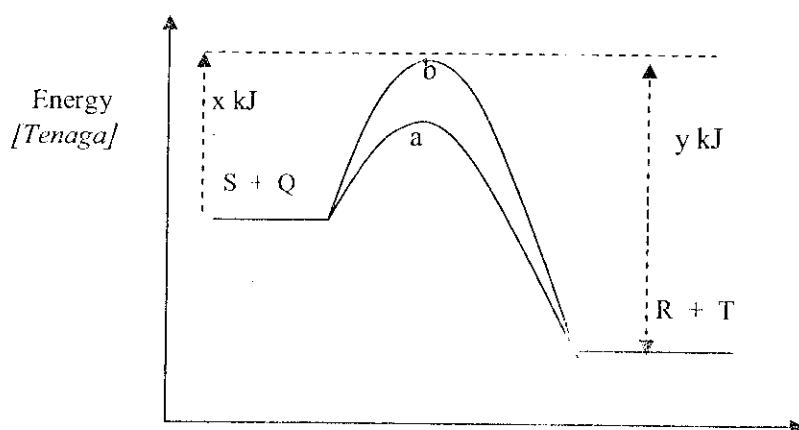


Diagram 11 [Rajah 11]

Which of the following is true?

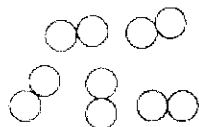
Antara berikut yang manakah benar?

- A The activation energy for the reaction with path b is $(y - x) \text{ kJ mol}^{-1}$
Tenaga pengaktifan bagi tindak balas dengan laluan b ialah $(y - x) \text{ kJ mol}^{-1}$
- B A catalyst is used in the reaction with path b
Tindak balas dengan laluan b menggunakan suatu mangkin
- C The heat of reaction for reaction with path b is $-(y - x) \text{ kJ mol}^{-1}$
Haba tindak balas bagi tindak balas dengan laluan b ialah $-(y - x) \text{ kJ mol}^{-1}$
- D S and Q with higher concentrations are used by the reaction with path b.
Tindak balas dengan laluan b menggunakan kepekatan S dan Q yang tinggi.

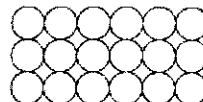
31. The melting point and boiling point of element R is -22°C and 276°C respectively. Which of the following diagrams shows the correct arrangement of particles of element R at -56°C ?

Takat lebur dan takat didih bagi unsur R ialah -22°C dan 276°C masing-masing. Antara rajah berikut yang manakah menunjukkan susunan zarah yang betul bagi unsur R pada -56°C ?

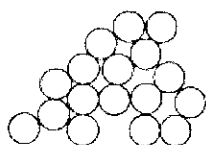
A



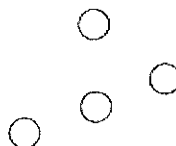
C



B



D



32. Diagram 12 shows the structure of an alkene.

Rajah 12 menunjukkan struktur bagi suatu alkena

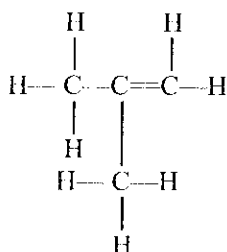


Diagram 12 [Rajah 12]

This alkene is prepared by dehydrating an alcohol using excess of hot concentrated sulphuric acid. Which alcohol is used to produce this alkene?

Alkena ini disediakan daripada pendehidratan suatu alkohol dengan menggunakan asid sulfurik pekat yang panas. Alkohol yang manakah digunakan untuk menghasilkan alkena ini?

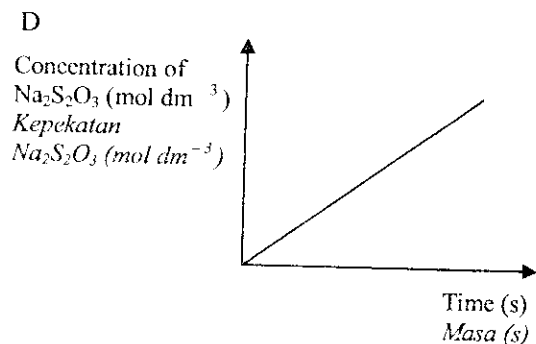
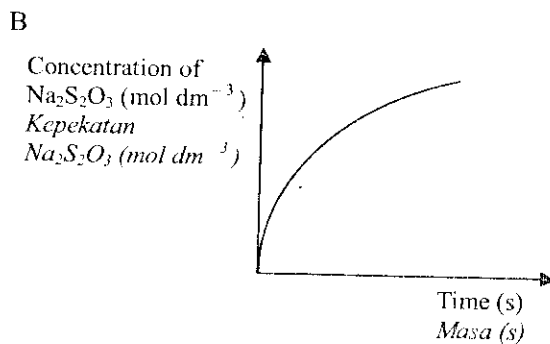
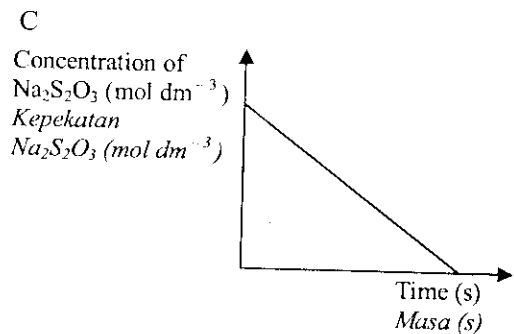
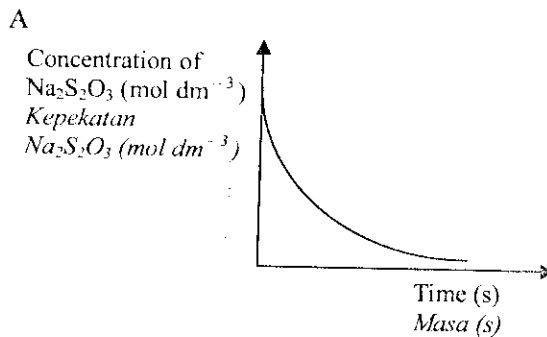
- A propanol [propanol]
 B butanol [butanol]
 C 2-methylbutan-1-ol [2-metilbutan-1-ol]
 D 2-methylpropan-1-ol [2-metilpropan-1-ol]

d22

33. 5 cm^3 of 0.5 mol dm^{-3} hydrochloric acid was added to 50 cm^3 of 0.2 mol dm^{-3} sodium thiosulphate solution. The time for sulphur to precipitate was taken. The experiment was repeated using 50 cm^3 of sodium thiosulphate solution of different concentrations.

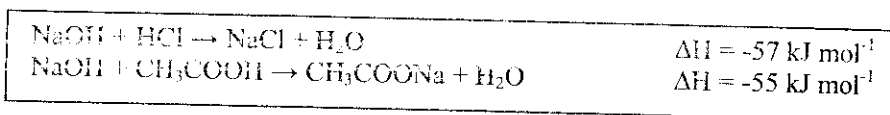
Which of the graphs below shows the relationship between the concentration of sodium thiosulphate solution and the time for sulphur to precipitate?

5 cm^3 asid hidroklorik 0.5 mol dm^{-3} telah ditambahkan kepada 50 cm^3 larutan natrium tiosulfat 0.2 mol dm^{-3} . Masa yang diambil untuk sulfur termendak diambil. Eksperimen diulangi dengan menggunakan 50 cm^3 larutan natrium tiosulfat yang berlainan kepekatan. Graf yang manakah menunjukkan hubungan antara kepekatan larutan natrium tiosulfat dengan masa yang diambil untuk sulfur termendak?



34. Two thermochemical equations for two neutralisation reactions are shown below.

Dua tindakbalas termokimia untuk dua tindakbalas peneutralan adalah seperti di bawah.

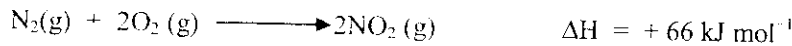


The values for the heat of neutralisation of these two reactions are different. What is the reason?
Nilai haba peneutralan untuk dua tindakbalas ini berbeza. Apakah sebabnya?

- A Ethanoic acid less soluble in water than hydrochloric acid
Asid etanoik kurang larut di dalam air daripada asid hidroklorik
- B Sodium ethanoate salt produced absorbed heat from the reaction
Garam natrium etanoat yang terhasil menyerap haba daripada tindak balas
- C Ethanoic acid produces more hydrogen ions than hydrochloric acid
Asid etanoik menghasilkan kurang ion hidrogen daripada asid hidroklorik
- D Heat is absorbed to ionise ethanoic acid molecules during the reaction
Tenaga haba diserap untuk mengionkan molekul-molekul asid etanoik dalam tindak balas itu.

35. The reaction between nitrogen and oxygen is shown in the equation below. Which of the following statements is true of the reaction?

Tindakbalas antara nitrogen dan oksigen adalah seperti persamaan di bawah. Antara kenyataan berikut yang manakah benar ?



- I The reaction releases heat
Tindak balas itu membebaskan haba
- II 33 kJ of heat is absorbed from the formation of 1 mole of nitrogen dioxide.
33 kJ tenaga diserap daripada pembentukan 1 mol nitrogen dioksida.
- III The activation energy of the reaction is 66 kJ mol^{-1}
Tenaga pengaktifan tindak balas ini adalah 66 kJ mol^{-1}
- IV The energy content of nitrogen dioxide gas is higher than the sum of the energy content of nitrogen gas and oxygen gas.
Jumlah kandungan tenaga nitrogen dioksida adalah lebih tinggi daripada jumlah kandungan tenaga gas nitrogen dan gas oksigen

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

36. Which of the following is true for one mole of the following substances ?

[Avogadro constant : $6.02 \times 10^{23} \text{ mol}^{-1}$, relative atomic mass : C=12]

Yang manakah antara berikut adalah benar bagi satu mol bahan ?

[Pemalar Avogadro : $6.02 \times 10^{23} \text{ mol}^{-1}$, jisim atom relatif : C =12]

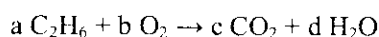
- A 1 mole of oxygen contains 6.02×10^{23} atoms
1 mol sulfur mengandungi 6.02×10^{23} atoms
- B 1 mole of magnesium chloride contains as many ions as the number of atoms in 12 g of carbon-12
1 mol magnesium klorida mengandungi ion sebanyak bilangan atom dalam 12 g karbon-12
- C 1 mole of nitrogen dioxide contains the same number of molecules as the number of atoms in 12 g of carbon-12
1 mol nitrogen dioksida mengandungi bilangan molekul yang sama dengan bilangan atom dalam 12g karbon-12
- D 1 mole of silver contains as many atoms as the number of atoms in 32 g of oxygen gas
1 mol argentum mengandungi bilangan atom yang sama dengan 32 g gas oksigen

37. The proton number of elements L and M are 8 and 12 respectively. L^{2-} ions and M^{2+} ions
Nombor proton unsur L dan M ialah 8 dan 12 masing-masing. Ion L^{2-} dan ion M^{2+}

- A contain the same number of protons [*mengandungi bilangan proton yang sama*]
- B contain the same number of electrons [*mengandungi bilangan elektron yang sama*]
- C contain the same number of neutrons [*mengandungi bilangan neutron yang sama*]
- D have the same chemical properties [*mempunyai sifat kimia yang sama*]

38. The chemical equation below shows the combustion of ethane in excess oxygen.

Persamaan kimia di bawah menunjukkan tindak balas pembakaran etana dalam oksigen yang berlebihan.



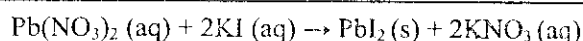
What are the values of a, b, c and d?

Apakah nilai bagi a, b, c and d?

	a	b	c	d
A	1	7	2	3
B	2	7	4	6
C	1	1	2	3
D	2	7	2	3

39. The reaction between lead(II) nitrate and potassium iodide is represented by the equation below.

Tindak balas antara plumbum(II) nitrat dan kalium iodida diwakili oleh persamaan di bawah



25.0 cm³ of 1.0 mol dm⁻³ potassium iodide solution is mixed with 25.0 cm³ of 1.0 mol dm⁻³ lead(II) nitrate solution. What is the maximum mass of lead(II) iodide produced in this reaction?

[Relative atomic mass : I = 127, Pb = 207]

25.0 cm³ 1.0 mol dm⁻³ larutan kalium iodida dicampurkan dengan 25.0 cm³ 1.0 mol dm⁻³ larutan plumbum(II) nitrat. Apakah jisim maksimum plumbum(II) iodida yang terhasil dalam tindak balas ini?

[Jisim atom relatif : I = 127, Pb = 207]

- A 4.18 g
- B 5.76 g
- C 8.35 g
- D 11.52 g

40. What is the type of chemical bond in the compound formed between the sodium and fluorine?
Apakah jenis ikatan kimia yang wujud di dalam bahan yang terhasil daripada natrium dan fluorin?
- A Single covalent bond [*Ikatan kovalen tunggal*]
 B Double covalent bond [*Ikatan kovalen ganda dua*]
 C Triple covalent bond [*Ikatan kovalen ganda tiga*]
 D Ionic bond [*Ikatan ion*]
41. Diagram 13 shows a compound formed by the elements P and Q.
Rajah 13 menunjukkan sebatian yang dibentuk oleh unsur P dan Q

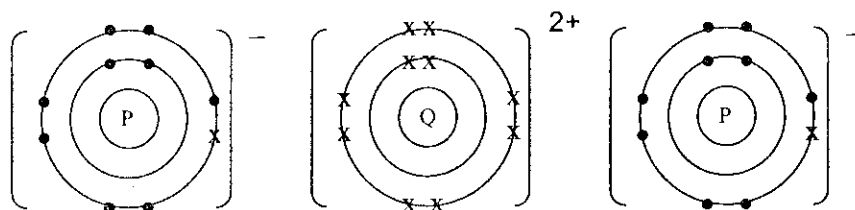


Diagram 13
Rajah 13

Which of the following statements are true about the compound?
Pernyataan manakah yang benar tentang sebatian ini?

- I The electron arrangement of atom Q is 2.8.2
Susunan elektron atom P ialah 2.8.2
- II The compound formed is a covalent compound
Sebatian terbentuk ialah sebatian kovalen
- III Atom Q donates two of its valence electrons to atoms P
Atom Q menderma dua elektron valensnya kepada atom-atom P
- IV Each atom of P receives one electron from atom Q
setiap atom P menerima satu elektron dari atom Q
- A I and II
 B I, III and IV
 C II, III and IV
 D I, II, III and IV
42. The formula of the carbonate ion is CO_3^{2-} and that of the nitrate ion is NO_3^- .
 If the formula of the sulphate salt of X is XCO_3 . What is the formula of the nitrate of X?
Formula bagi ion karbonat ialah CO_3^{2-} dan ion nitrat ialah NO_3^- . Jika formula bagi garam sulfat X ialah XCO_3 , apakah formula untuk nitrat X?
- A XNO_3
 B X_2NO_3
 C $\text{X}(\text{NO}_3)_2$
 D $\text{X}(\text{NO}_3)_3$

43. Diagram 14 shows the results of a series of tests that are carried out by a student on solution Y.
Rajah 14 menunjukkan keputusan satu siri ujian yang dijalankan oleh seorang pelajar terhadap larutan Y.

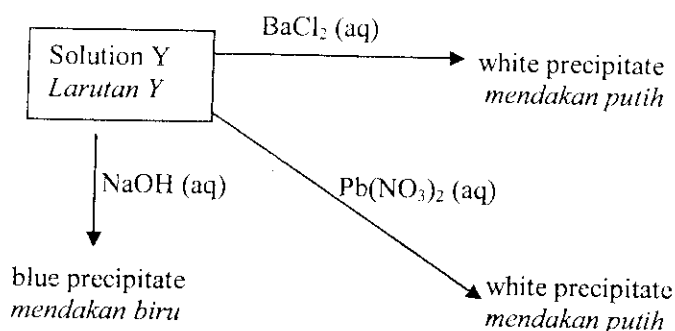


Diagram 14[Rajah 14]

Which of the following could be solution Y?

Antara yang berikut, yang manakah mungkin larutan Y

- A Copper(II) chloride [kuprum(II) klorida]
 - B Zinc chloride [zink klorida]
 - C Copper(II) sulphate [kuprum(II) sulfat]
 - D Magnesium sulphate [magnesium sulfat]
44. Diagram 15 shows the conversion of carbon compound A through two different process.
Rajah 15 menunjukkan penukaran sebatian carbon melalui dua proses yang berlainan.

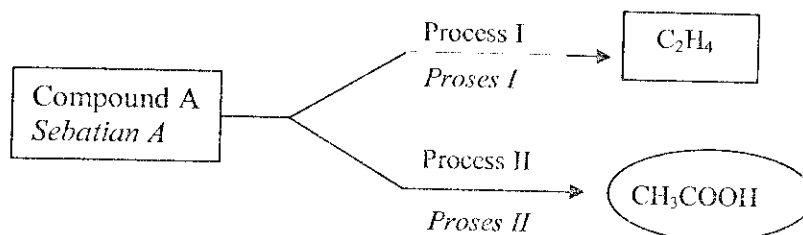


Diagram 15[Rajah 15]

Which of the following is compound A, process I and II?

Yang manakah antara berikut merupakan sebatian A, proses I dan II?

	Compound A Sebatian A	Process I Proses I	Process II Proses II
A	Ethanoic acid Etanoik asid	Esterification Pengesteran	Dehydration Pendehidratan
B	Ethanol Etanol	Dehydration Pendehidratan	Oxidation Pengoksidaan
C	Ethene Etena	Oxidation Pengoksidaan	Esterification Pengesteran
D	Ethanol Etanol	Oxidation Pengoksidaan	Dehydration Pendehidratan

45. Which of the following substances, when added to aqueous ammonia will increase the pH value of the alkaline solution?

Antara bahan berikut, yang manakah apabila ditambahkan kepada larutan ammonia akan meningkatkan nilai pH larutan beralkali tersebut?

- A Water [Air]
- B Zinc oxide [Zink oksida]
- C Potassium oxide [Kalium oksida]
- D Hydrogen chloride gas [Gas hidrogen klorida]

46. Diagram 16 shows a label on a bottle of tomato sauce.

Rajah 16 menunjukkan label pada satu botol sos tomato.

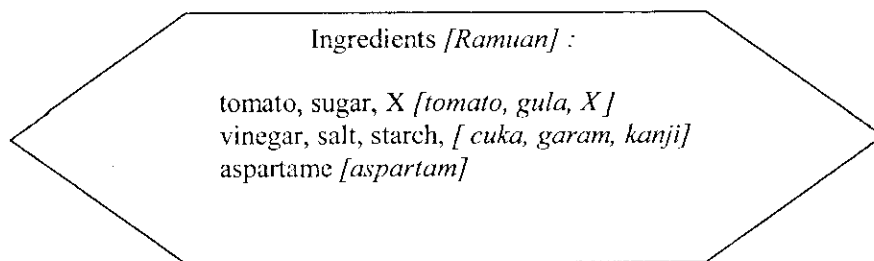


Diagram 16 [Rajah 16]

The tomato sauce can last longer due to the presence of X. What is X?

Sos tomato tahan lama kerana kehadiran X. Apakah X?

- A Azo compound [Sebatian azo]
- B Benzoic acid [Asid benzoik]
- C Acacia gum [Gam akasia]
- D Monosodium glutamate [Mononatrium glutamat]

47. Diagram 17 shows the set up of the apparatus used to study the reaction between a metal oxide and carbon.

Rajah 17 menunjukkan susunan radas yang digunakan untuk mengkaji tindak balas antara suatu oksida logam dengan karbon.

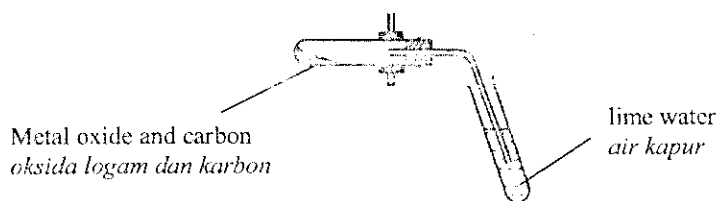


Diagram 17 [Rajah 17]

The lime water turns cloudy. What metal oxide is used?

Air kapur menjadi keruh. Apakah oksida logam digunakan?

- A Magnesium oxide [Magnesium oksida]
- B Calcium oxide [Kalsium oksida]
- C Copper(II) oxide [Kuprum(II) oksida]
- D Aluminium oxide [Aluminium oksida]

48. Diagram 18 shows the energy level diagram of a displacement reaction between magnesium and iron(II) sulphate solution.

Rajah 18 menunjukkan gambarajah aras tenaga bagi satu tindak balas penyesaran antara magnesium dan larutan besi(II) sulfat.

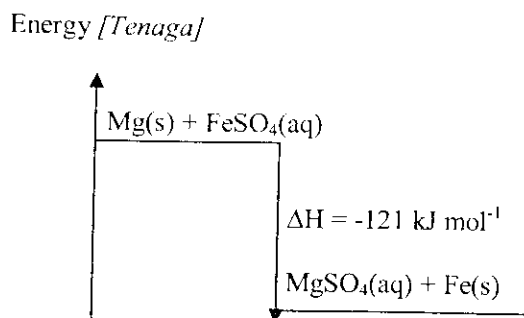


Diagram 18 [Rajah 18]

What is the change in temperature when excess magnesium powder is added to 100 cm³ of 0.25 mol dm⁻³ iron(II) sulphate solution?

[Specific heat capacity of a solution = 4.2 J g⁻¹ °C]

Apakah perubahan suhu apabila serbuk magnesium yang berlebihan ditambahkan kepada 100 cm³ larutan besi(II) sulfat dengan kepekatan 0.25 mol dm⁻³?

[Muatan haba tentu larutan = 4.2 J g⁻¹ °C]

- A 6 °C
- B 2.4 °C
- C 7.2 °C
- D 12.0 °C
49. Reaction between Fe²⁺ ions and MnO₄⁻ ions is represented by the following equation.
- Tindak balas antara ion Fe²⁺ dan ion MnO₄⁻ diwakili oleh persamaan berikut.*
- $$5\text{Fe}^{2+}(\text{aq}) + \text{MnO}_4^{-}(\text{aq}) + 8\text{H}^{+}(\text{aq}) \rightarrow 5\text{Fe}^{3+}(\text{aq}) + \text{Mn}^{2+}(\text{aq}) + 4\text{H}_2\text{O}(\text{l})$$

Which of the following information is true?

Manakah antara maklumat berikut adalah benar?

- I The oxidation number of manganese changes from +7 into +2
Nombor pengoksidaan mangan berubah dari +7 kepada +2
- II The oxidation number of hydrogen changes from +1 to 0
Nombor pengoksidaan hidrogen berubah dari +1 ke 0
- III The green colour of Fe²⁺ solution turn to brown
Larutan hijau ion Fe²⁺ berubah ke perang
- IV Iron(II) ion is reduced
Ion ferum(II) telah diturunkan
- A I and II
- B I and III
- C II, III and IV
- D I, II, III and IV

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Dapatkan skema Jawapan di Laman

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50. Diagram 20 shows the set up of an experiment to study the effect of different metals on the rusting of iron.

Rajah 20 menunjukkan susunan radas bagi eksperimen untuk mengkaji kesan logam yang berlainan terhadap pengurangan besi

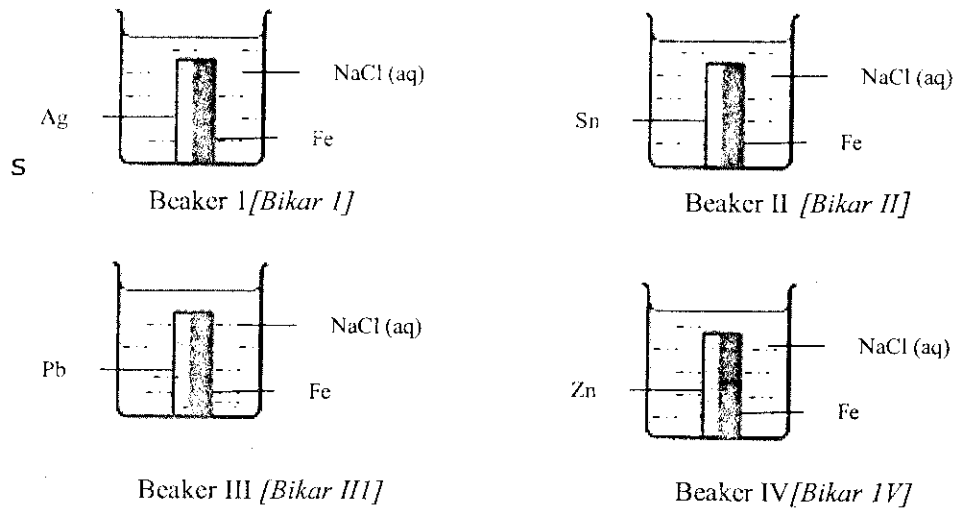


Diagram 20 [Rajah 20]

In which beaker the iron plate will rust the most after 2 days?

Bikar manakah menunjukkan kepingan besi paling berkarat selepas 2 hari?

- A Beaker I [Bikar I]
- B Beaker II [Bikar II]
- C Beaker III [Bikar III]
- D Beaker IV [Bikar IV]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT