

SULIT
4541/1
Chemistry
Paper 1
Ogos
2008
1¼ jam

4541/1



**SEKOLAH BERASRAMA PENUH
BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH/KLUSTER
KEMENTERIAN PELAJARAN MALAYSIA**

PEPERIKSAAN PERCUBAAN SPM TAHUN 2008

KIMIA

Kertas 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI HINGGA DIBERITAHU

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

Kertas soalan ini mengandungi 22 halaman bercetak

1. Diagram 1 shows the electron arrangement of an atom of element P.
Rajah 1 menunjukkan susunan elektron bagi atom unsur P.

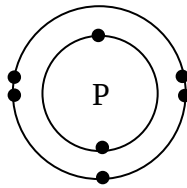


Diagram 1
Rajah 1

What is the number of valence electrons in atom P ?
Berapakah bilangan elektron valen bagi atom P?

- A 7
 B 6
 C 5
 D 4
2. What are the symbols of the elements of chromium, copper , manganese and potassium?
Apakah simbol bagi unsur kromium, kuprum, mangan dan kalium?

	Chromium <i>Kromium</i>	Copper <i>Kuprum</i>	Manganese <i>Mangan</i>	Potassium <i>Kalium</i>
A	C	Co	Mg	K
B	C	Cu	Mn	P
C	Cr	Co	Mg	P
D	Cr	Cu	Mn	K

3. The following statement is about the arrangement of the elements in the Periodic Table of Elements.
Pernyataan berikut adalah mengenai susunan unsur di dalam Jadual Berkala Unsur.

Elements are arranged in order of increasing atomic mass in The Periodic Table
Unsur-unsur disusun mengikut jisim atom menaik dalam Jadual Berkala

Which of the following scientists made the above statement?
Antara saintis berikut siapakah yang membuat pernyataan di atas?

- A Meyer
 B Newlands
 C Mendeleev
 D Dobereiner

4. Diagram 2 shows the set-up of the apparatus for electrolysis.
 Diagram 2 menunjukkan susunan radas bagi elektrolisis.

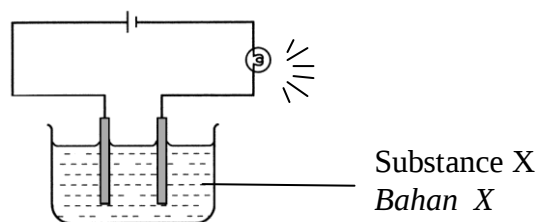


Diagram 2
 Rajah 2

Which of the following compounds could be used as substance X?
 Antara berikut, yang manakah boleh digunakan sebagai bahan X?

- A Ethene, C_2H_4
 Etana, C_2H_4
- B Sodium chloride solution, $NaCl$
 Natrium klorida, $NaCl$
- C Chloromethane, CH_3Cl
 Klorometana, CH_3Cl
- D Ethyl ethanoate, $CH_3COOC_2H_5$
 Etil etanoat, $CH_3COOC_2H_5$
5. What are the ions present in molten sodium chloride and sodium chloride aqueous solution?
 Apakah ion-ion yang wujud dalam leburan natrium klorida dan larutan akues natrium klorida?

	Molten sodium chloride <i>Leburan natrium klorida</i>	Sodium chloride aqueous solution <i>Larutan akues natrium klorida</i>
A	Na^+ , H^+ , Cl^- , OH^-	Na^+ , H^+ , Cl^- ,
B	Na^+ , Cl^-	OH^- , Cl^-
C	Na^+ , Cl^-	Na^+ , Cl^- , H^+ , OH^-
D	Na^+ , OH^-	Na^+ , Cl^- , H^+ , OH^-

6. Which of the following solutions can show a pH value of 8?
 Antara larutan berikut yang manakah boleh menunjukkan nilai pH 8?

- A 0.1 mol dm^{-3} of ethanoic acid
 Asid etanoik 0.1 mol dm^{-3}
- B 0.1 mol dm^{-3} of hydrochloric acid
 Asid hidroklorik 0.1 mol dm^{-3}
- C 0.1 mol dm^{-3} of ammonia solution
 Larutan ammonia 0.1 mol dm^{-3}
- D 0.1 mol dm^{-3} of sodium hydroxide solution
 Larutan natrium hidroksida 0.1 mol dm^{-3}

7. Which of the following compounds is a soluble salt?
Antara sebatian berikut, yang manakah adalah garam terlarutkan?
- A Lead(II) iodide
Plumbum(II) iodida
- B Barium sulphate
Barium sulfat
- C Calcium chloride
Kalsium klorida
- D Magnesium carbonate
Magnesium karbonat
8. Diagram 3 shows the stages involved in the Contact Process to produce sulphuric acid.
Rajah 3 menunjukkan peringkat yang terlibat dalam Proses Sentuh untuk menghasilkan asid sulfurik.

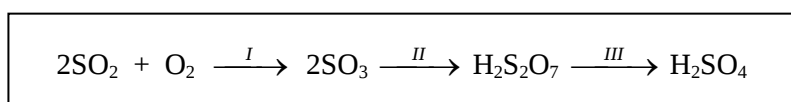


Diagram 3
Rajah 3

What is the optimum temperature and the catalyst used in stage I?
Apakah suhu optimum dan mangkin yang digunakan dalam peringkat I?

	Temperature / °C <i>Suhu / °C</i>	Catalyst <i>Mangkin</i>
A	450	Vanadium(V) oxide <i>Vanadium(V) oksida</i>
B	200	Vanadium(V) oxide <i>Vanadium(V) oksida</i>
C	450	Iron powder <i>Serbuk besi</i>
D	300	Iron powder <i>Serbuk besi</i>

9. Which of the following compounds is an organic compound?
Antara sebatian berikut, yang manakah sebatian organik?
- A Calcium carbonate, CaCO_3
Kalsium karbonat, CaCO_3
- B Carbonic acid, H_2CO_3
Asid karbonik, H_2CO_3
- C Carbon dioxide, CO_2
Karbon dioksida, CO_2
- D Glucose, $\text{C}_6\text{H}_{12}\text{O}_6$
Glukos, $\text{C}_6\text{H}_{12}\text{O}_6$

10. Diagram 4 shows the graph of volume of carbon dioxide gas against time when 5 g of marble chips is added to 50 cm³ of 0.2 mol dm⁻³ hydrochloric acid.
Rajah 4 menunjukkan graf isipadu gas karbon dioksida melawan masa apabila 5g ketulan marmar dimasukkan ke dalam 50 cm³ asid hidroklorik 0.2 mol dm⁻³.

Volume of CO₂ gas / cm³

Isipadu gas CO₂ / cm³

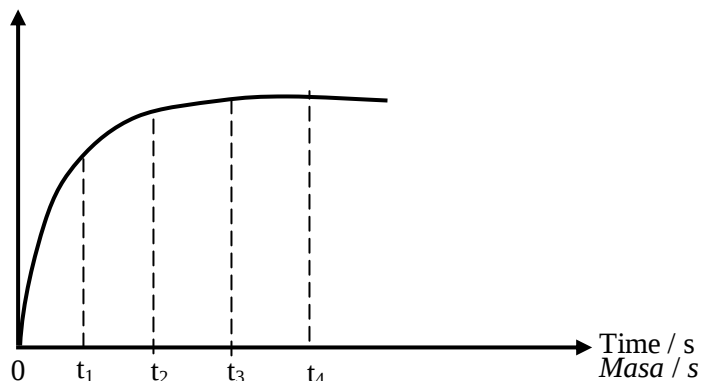


Diagram 4

Rajah 4

At what time the rate of reaction the highest?

Pada masa manakah kadar tindak balas paling tinggi?

- A t₁
- B t₂
- C t₃
- D t₄

11. The following ionic equation shows a redox reaction.
Persamaan ion di bawah mewakili satu tindak balas redoks.
- $$2\text{Fe}^{2+} + \text{Br}_2 \rightarrow 2\text{Fe}^{3+} + 2\text{Br}^-$$

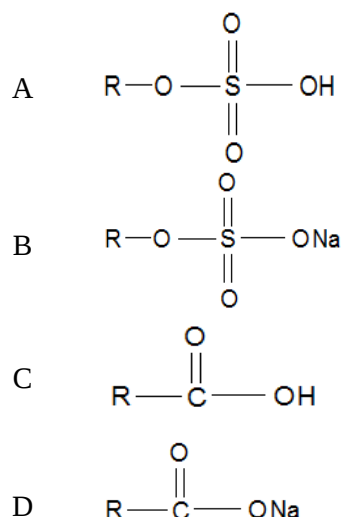
Which of the following is true about the reaction?

Antara pernyataan berikut, yang manakah benar berkaitan tindakbalas di atas?

- A Iron(III) ion, Fe³⁺ is reduced
Ion ferum(III), Fe³⁺ diturunkan
- B Iron(II) ion, Fe²⁺ is oxidised
Ion ferum(II), Fe²⁺ dioksidakan
- C Bromine water is a reducing agent
Air bromin merupakan agen penurunan
- D Bromide ion is an oxidising agent
Ion bromida merupakan agen pengoksidaan

12. Which of the following processes absorbs heat energy?
Antara proses berikut yang manakah merupakan proses serap tenaga haba?
- A Combustion of a hydrocarbon
Pembakaran hidrokarbon
 - B Neutralisation between acid and alkali
Peneutralan antara asid dan alkali
 - C Dissolving sodium hydroxide in water
Melarutkan natrium hidroksida dalam air
 - D Breaking the H-H bond in the hydrogen molecule
Memecahkan ikatan H-H dalam molekul hidrogen

13. Which of the following structural formulas is of soap?
Antara formula struktur berikut yang manakah bagi sabun?



14. Atom of element X has a proton number of 13. Where is X located in the Periodic Table of Elements?
Atom unsur X mempunyai nombor proton 13. Dimanakah kedudukan X di dalam Jadual Berkala Unsur?

	Group <i>Kumpulan</i>	Period <i>Kala</i>
A	3	2
B	3	3
C	13	2
D	13	3

15. Which of the following substances is made up of atoms?
Antara bahan berikut yang manakah terdiri daripada atom-atom?
- A Argon
 B Nitrogen
 C Chlorine
 D Ammonia
16. Which of the following physical properties is true of copper(II) chloride?
Antara sifat fizik berikut yang manakah benar bagi kuprum(II) klorida?
- A It is a volatile substance
Ia adalah sebatian yang meruap
 B It dissolves in organic solvent
Ia larut dalam pelarut organik
 C It conduct electricity in aqueous solution
Ia mengkonduksi elektrik dalam larutan akues
 D It burns in oxygen to produce white fumes
Ia terbakar dalam oksigen dengan nyalaan putih

17. Diagram 5 shows the set up of apparatus to determine the empirical formula for metal oxide.
Rajah 5 menunjukkan susunan radas untuk menentukan formula empirik oksida logam.

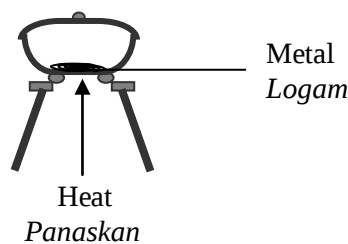


Diagram 5
Rajah 5

- Which of the following metals is most suitable to be used in the diagram?
Logam yang manakah yang paling sesuai digunakan dalam rajah itu?
- A Lead
Plumbum
B Silver
Argentum
C Copper
Kuprum
D Magnesium
Magnesium
- 18 Which of the following ions form a precipitate that dissolve in excess ammonia solution?
Antara ion-ion berikut, yang manakah akan menghasilkan mendakan yang larut dalam larutan ammonia berlebihan?
- I Zn^{2+}
II Al^{3+}
III Pb^{2+}
IV Cu^{2+}
- A I and IV only
B II and IV only
C I and III only
D I, II and III only
- 19 Element X is a reducing agent. Which of the following electron arrangements is for atom X?
X adalah agen penurunan. Antara susunan elektron berikut adalah bagi atom unsur X?
- A 2.8.2
B 2.8.8
C 2.8.7
D 2.8.4

- 20 Diagram 6 shows a metal X spoon dipped in a salt solution inside metal Y container.
Rajah 6 menunjukkan sudu logam X direndamkan dalam larutan garam di dalam bekas logam Y

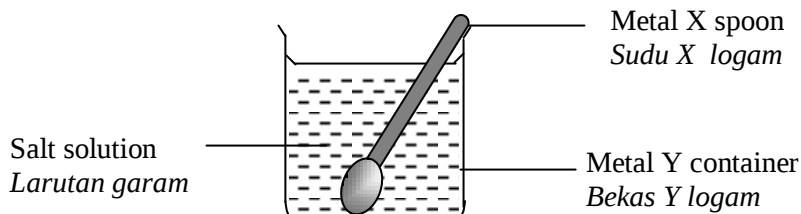


Diagram 6
Rajah 6

If element X is more electropositive than Y, which of the following statements are true about the diagram?

Jika unsur X lebih elektropositif daripada Y, pernyataan yang manakah betul berkaitan tindak balas di atas?

- I Metal X spoon undergoes corrosion
Sudu X logam mengalami kakisan
- II Metal Y is oxidised
Logam Y teroksida
- III Mass of metal X spoon decreases
Jisim sudu X logam berkurang
- IV Atom of metal X spoon is ionised
Atom sudu X logam mengion
- A I and III only
- B II and IV only
- C I, III and IV only
- D I, II, III and IV
- 21 Which of the following solutions have the same number of hydrogen ions, H^+ , as in 50 cm^3 of 0.1 mol dm^{-3} sulphuric acid, H_2SO_4 ?
Antara larutan berikut, yang manakah mempunyai bilangan ion hidrogen, H^+ , sama seperti dalam 50 cm^3 0.1 mol dm^{-3} asid sulfurik, H_2SO_4 ?
- I 100 cm^3 of 0.1 mol dm^{-3} hydrochloric acid, HCl
 100 cm^3 0.1 mol dm^{-3} asid hidroklorik, HCl
- II 50 cm^3 of 0.2 mol dm^{-3} nitric acid, HNO_3
 50 cm^3 0.2 mol dm^{-3} asid nitrik, HNO_3
- III 100 cm^3 of 0.1 mol dm^{-3} ethanoic acid, CH_3COOH
 100 cm^3 0.1 mol dm^{-3} asid etanoik, CH_3COOH
- IV 50 cm^3 of 0.1 mol dm^{-3} phosphoric acid, H_3PO_4
 50 cm^3 0.1 mol dm^{-3} asid fosforik, H_3PO_4
- A I and II only
- B I and III only
- C III and IV only
- D I, II and III only

22. Diagram 7 shows molecular structure of a polymer.

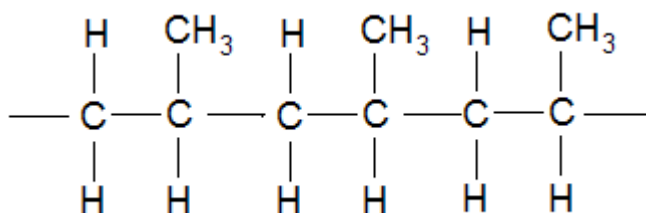


Diagram 7
Rajah 7

What is the name of the monomer of the polymer in the diagram?
Apakah nama monomer bagi polimer dalam rajah tersebut?

- A Ethene
Etena
- B Butene
Butena
- C Propene
Propena
- D Chloroethene
Kloroetena
- 23 Table 1 shows the relative atomic mass of helium, carbon, sulphur and copper
Jadual 1 menunjukkan jisim atom relatif bagi helium, karbon, sulfur dan kuprum

Element Unsur	Helium	Carbon	Sulphur	Copper
Relative atomic mass Jisim atom relatif	4	12	32	64

Table 1
Jadual 1

Which of the following statements is **true**?
Antara pernyataan berikut yang manakah **benar**?

[Avogadro constant = $6.0 \times 10^{23} \text{ mol}^{-1}$]
[Pemalar Avogadro = $6.0 \times 10^{23} \text{ mol}^{-1}$]

- A Mass of one copper atom is 64 g
Jisim satu atom kuprum ialah 64 g
- B Mass of 1 mol of helium is 8 g
Jisim 1 mol gas helium ialah 8 g
- C 32 g of sulphur contains 6.02×10^{23} sulphur atom
32g sulfur mempunyai 6.02×10^{23} atom sulfur
- D Mass of one sulphur atom is 32 times bigger than one carbon atom
Jisim satu atom unsur ialah 32 kali lebih besar daripada jisim satu atom karbon

24. Diagram 8 shows the energy profile diagram for the following reaction:
Rajah 8 menunjukkan gambarajah aras tenaga bagi tindak balas berikut:

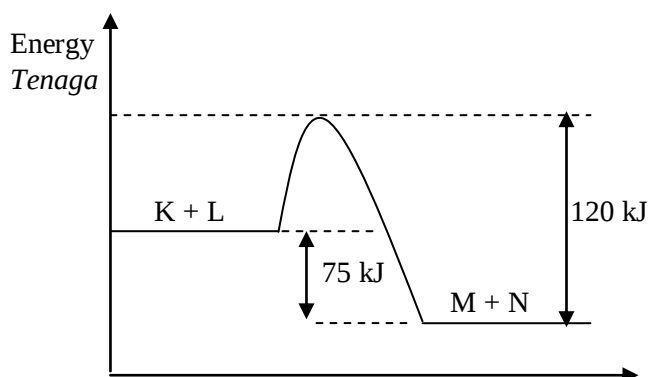
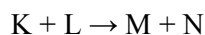


Diagram 8
 Rajah 8

What is the value of the activation energy?
Apakah nilai tenaga pengaktifan?

- A 25 kJ
 B 45 kJ
 C 75 kJ
 D 120 kJ
25. In the saponification process, concentrated sodium hydroxide solution is added to boiling vegetable oils to produce X and soaps. What is X?
Dalam proses saponifikasi, larutan natrium hidroksida pekat ditambahkan kepada minyak sayuran yang dididih untuk menghasilkan X dan sabun. Apakah X?
- A Ethanol
Etanol
 B Glycerol
Gliserol
 C Propanol
Propanol
 D Butanoic acid
Asid butanoik

26. Diagram 9 shows the energy level diagram for the reaction between silver ions and chloride ions.
Rajah 9 menunjukkan gambarajah aras tenaga bagi tindak balas antara ion argentum dengan ion klorida.

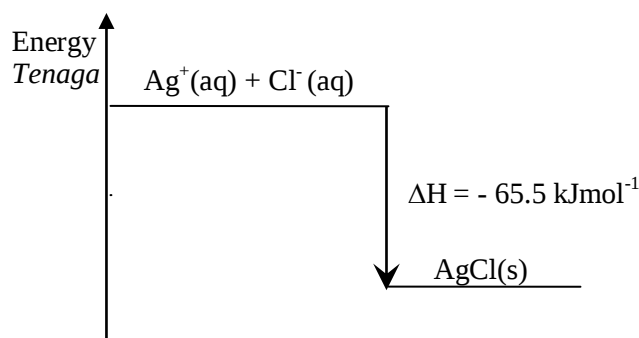


Diagram 9
Rajah 9

- Which of the following statements is true about this reaction?
Yang manakah antara pernyataan berikut adalah benar mengenai tindak balas ini?
- A Endothermic reaction occurs
Tidak balas endotermik berlaku
 - B The energy content of the product is higher than the reactants
Kandungan tenaga hasil tindak balas adalah lebih tinggi daripada bahan tindak balas
 - C 65 kJ of heat is absorbed when 1 mol of silver chloride is formed
65 kJ tenaga diserap apabila 1 mol argentum klorida terbentuk
 - D The final temperature at the end of the reaction is higher than the initial temperature
Suhu akhir tindak balas adalah lebih tinggi daripada suhu awal tindak balas
27. Atom of oxygen-18 has 8 electrons. How many neutrons does an atom of oxygen-18 contains?
Atom oksigen-18 mempunyai 8 elektron. Berapakah bilangan neutron bagi atom oksigen-18?
- A 6
 - B 8
 - C 10
 - D 18
28. The following elements are in Group 17 in the Periodic Table of Elements **except**
*Unsur-unsur berikut berada dalam Kumpulan 17 dalam Jadual Berkala Unsur **kecuali***
- A bromine
bromin
 - B chlorine
klorin
 - C helium
helium
 - D iodine
iodin

29. The following statement is about X^{3+} ion.
Pernyataan berikut adalah berkaitan ion X^{3+} .

X^{3+} ion has 14 neutrons and 10 electrons.
Ion X^{3+} mempunyai 14 neutron dan 10 elektron

Which of the following proton numbers and nucleon numbers shows for atom X?
Yang manakah antara berikut menunjukkan nombor proton dan nombor nukleon bagi atom X?

	Proton number <i>Nombor proton</i>	Nucleon number <i>Nombor nukleon</i>
A	10	14
B	10	27
C	13	14
D	13	27

30. Diagram 10 shows the electron arrangement of a compound formed between element T and element Q.
Diagram 10 menunjukkan susunan elektron bagi sebatian yang terbentuk daripada unsur T dan unsur Q.

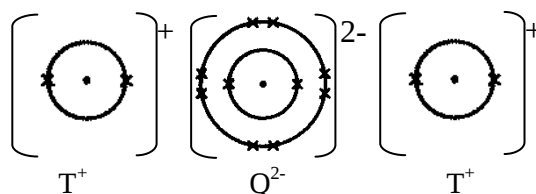


Diagram 10
Rajah 10

What group in the Periodic Table of Elements is element Q located?
Apakah kumpulan dalam Jadual Berkala Unsur kedudukan unsur Q?

- A 2
 B 8
 C 16
 D 18
31. Which of the following pairs of substances is most suitable to prepare copper(II) sulphate salt?
Yang manakah antara pasangan bahan kimia berikut paling sesuai untuk menyediakan garam kuprum(II) sulfat?
- A Copper with dilute sulphuric acid
Kuprum dan larutan asid sulfurik cair
 B Copper(II) chloride with dilute sulphuric acid
Kuprum(II) klorida dan larutan asid sulfurik cair
 C Copper(II) carbonate with dilute sulphuric acid
Kuprum(II) karbonat dan larutan asid sulfurik cair
 D Copper(II) nitrate solution with sodium sulphate solution
Larutan kuprum(II) nitrat dan larutan natrium sulfat

- 32 Diagram 11 shows the set-up of apparatus of an electrolysis process.
Rajah 11 menunjukkan susunan radas bagi satu proses elektrolisis.

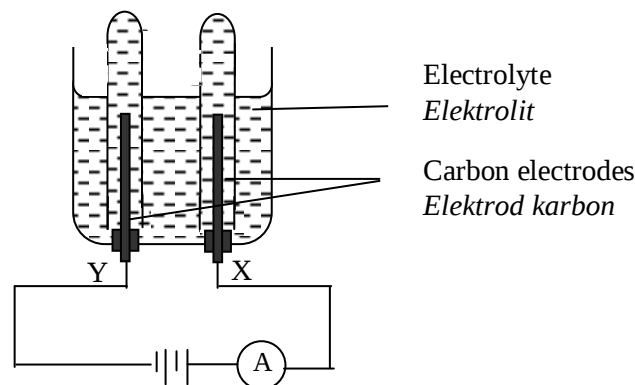


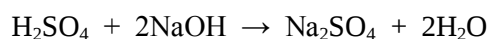
Diagram 11
Rajah 11

Which of the following electrolytes produce oxygen gas at electrode X ?
Antara elektrolit berikut, yang manakah menghasilkan gas oksigen di elektrod X ?

- I 1.0 mol dm⁻³ hydrochloric acid
Asid hidroklorik 1.0 mol dm⁻³
 - II 1.0 mol dm⁻³ sulphuric acid
Asid sulfurik 1.0 mol dm⁻³
 - III 1.0 mol dm⁻³ potassium nitrate solution
Larutan kalium nitrat 1.0 mol dm⁻³
 - IV 1.0 mol dm⁻³ potassium bromide
Larutan kalium bromida 1.0 mol dm⁻³
- A I and II only
 - B II and III only
 - C III and IV only
 - D II, III and IV only

33. The following equation represents the reaction between sodium hydroxide solution and dilute sulphuric acid.

Persamaan berikut mewakili tindak balas antara larutan natrium hidroksida dengan asid sulfurik cair.



What is the volume of 0.5 mol dm⁻³ sulphuric acid needed to neutralise 50 cm³ of 0.5 mol dm⁻³ sodium hydroxide?

Apakah isipadu 0.5 mol dm⁻³ asid sulfurik yang diperlukan untuk meneutralkan 50 cm³ 0.5 mol dm⁻³ natrium hidroksida?

- A 12.5 cm³
- B 25.0 cm³
- C 50.0 cm³
- D 75.0 cm³

34. Which of the following statements explains why ceramic is suitable to make an engine block?
Yang manakah antara pernyataan berikut menerangkan mengapa seramik sesuai untuk membina blok enjin?

- A Ceramic is chemically inert
Seramik adalah lengai secara kimia
 B Ceramic is an electric conductor
Seramik adalah konduktor elektrik
 C Ceramic can withstand high temperature
Seramik boleh tahan suhu yang tinggi
 D Ceramic has a low specific heat capacity
Seramik mempunyai muatan haba tentu yang rendah

35. Table 3 shows the proton number of elements S, T, U and V.
Jadual 3 menunjukkan nombor proton bagi unsur S, T, U dan V.

Element <i>Unsur</i>	S	T	U	V
Proton number <i>Nombor proton</i>	11	14	16	19

Table 3
Jadual 3

What is the arrangement of elements S, T, U and V in **ascending** order of atomic size?
Apakah susunan saiz atom secara menaik bagi unsur-unsur S, T, U dan V?

- A S, T, U, V
 B S, V, T, U
 C V, U, T, S
 D U, T, S, V
36. C_4H_8 is the molecular formula for isomers X and Y.
 C_4H_8 ialah formula molekul bagi isomer X dan Y.
- Which of the following statements is true of isomers X and Y?
Antara pernyataan berikut yang manakah benar tentang X dan Y?
- A X and Y have similar molecular structure
X dan Y mempunyai struktur molekul yang sama
 B X and Y have similar chemical properties
X dan Y mempunyai sifat kimia yang sama
 C X and Y have different relative molecular mass
X dan Y mempunyai jisim molekul relatif yang sama
 D X and Y have similar physical properties
X dan Y mempunyai sifat fizik yang sama.

37. Diagram 12 shows curve X obtained when 8 g of granulated zinc (in excess) is reacted with 50 cm³ of 1 mol dm⁻³ sulphuric acid.
 Rajah 12 menunjukkan lengkung X apabila 8 g ketulan zink (berlebihan) bertindak balas dengan 50 cm³ asid sulfurik 1 mol dm⁻³.

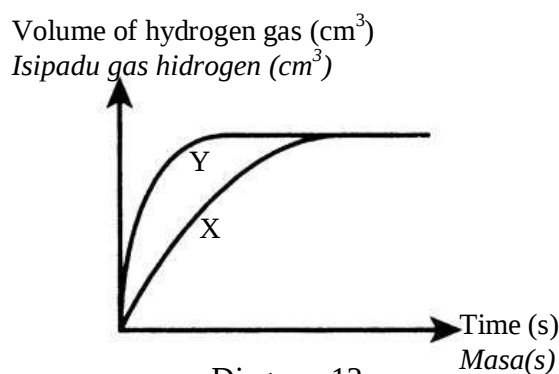


Diagram 12
 Rajah 12

Which of the following reactions produces curve Y?
 Antara tindak balas berikut yang manakah menghasilkan lengkung Y?

- A 8 g zinc powder + 50 cm³ of 2 mol dm⁻³ sulphuric acid
 8 g serbuk zink + 50 cm³ of 2 mol dm⁻³ sulfurik acid
- B 8 g zinc powder + 50 cm³ of 1 mol dm⁻³ of sulphuric acid
 8 g serbuk zink + 50 cm³ of 1 mol dm⁻³ sulfurik acid
- C 8 g granulated zinc + 100 cm³ of 1 mol dm⁻³ of sulphuric acid
 8 g ketulan zink + 100 cm³ of 1 mol dm⁻³ sulfurik acid
- D 8 g granulated zinc + 50 cm³ of 2 mol dm⁻³ of sulphuric acid
 8 g ketulan zink + 50 cm³ of 2 mol dm⁻³ sulfurik acid
38. The following statements are about atom G and J.
 Pernyataan berikut adalah mengenai atom G dan J.
- Electron arrangement of atom G is 1
 Susunan elektron atom G ialah 1
 - Proton number of atom J is 6
 Nombor proton atom J ialah 6

What is the formula of the compound formed between G and J?
 Apakah formula bagi sebatian yang terbentuk antara G dan J?

- A JG
 B JG₂
 C JG₃
 D JG₄

39. Diagram 13 shows the set up of apparatus to investigate the effect of metals X, Y and Z on the rusting of iron

Rajah 13 menunjukkan susunan radas untuk mengkaji kesan logam X, Y dan Z ke atas pengurangan paku besi

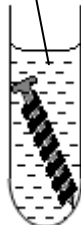
	A	B	C
Experiment	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 	Hot agar solution + potassium hexacyanoferrate(III) <i>Agar-agar panas + kalium heksasianoferrat(III)</i> 
Material <i>Bahan</i>	Iron nail and metal X <i>Paku besi dengan logam X</i>	Iron nail and metal Y <i>Paku besi dengan logam Y</i>	Iron nail and metal Z <i>Paku besi dengan logam Z</i>
Observation <i>Pemerhatian</i>	Small amount of blue spot <i>Sedikit tompok biru</i>	No change <i>Tiada perubahan</i>	A lot of blue spot <i>Banyak tompok biru</i>

Diagram 13

Rajah 13

Which of the following arrangements of metals X, Y and Z is in descending order of their electropositivity?

Yang manakah antara berikut adalah susunan logam X, Y dan Z mengikut tertib keelektropositifan menurun?

- A X, Y, Z
- B Y, X, Z
- C Z, X, Y
- D Y, Z, X

40. 7 g of potassium hydroxide is dissolved in distilled water to form 250 cm³ of solution. What is the molarity of the potassium hydroxide solution?
[Relative atomic mass: H=1, O=16, K=39]

*7 g kalium hidroksida dilarutkan ke dalam air suling untuk membentuk 250 cm³ larutan. Apakah kemolaran larutan kalium hidroksida tersebut?
[Jisim atom relatif: H=1, O=16, K=39]*

- A 0.03 mol dm⁻³
- B 0.05 mol dm⁻³
- C 0.30 mol dm⁻³
- D 0.50 mol dm⁻³

41. Diagram 14 shows the energy level diagram of the displacement reaction between magnesium and iron(II) chloride solution.
Rajah 14 menunjukkan gambarajah aras tenaga bagi tindak balas penyesaran antara magnesium dan larutan ferum(II) sulfat.

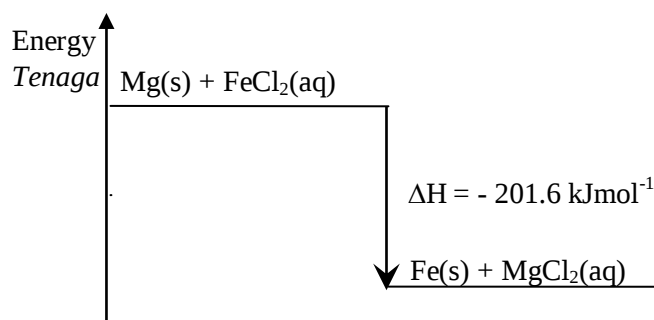


Diagram 14
Rajah 14

What is the increase in temperature if 50 cm^3 of 0.25 mol dm^{-3} iron(II) chloride solution is reacted with excess magnesium,?
Berapakah kenaikan suhu, jika 50 cm^3 0.25 mol dm^{-3} larutan ferum(III) klorida ditindak balaskan dengan berlebihan magnesium ?

[Specific heat capacity of the solution = $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$]
 [Muatan haba tentu larutan = $4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$]

- A 12°C
 B 16°C
 C 22°C
 D 24°C
42. Table 3 shows the results of an experiment for three chemical cells P, Q and R.
Jadual 3 menunjukkan keputusan eksperimen bagi tiga sel kimia P, Q dan R.

Chemical cell <i>Sel kimia</i>	Pairs of metals <i>Pasangan logam</i>	Voltage (V) <i>Voltan (V)</i>	Negative terminal <i>Terminal negatif</i>
P	X – Y	0.45	X
Q	X – Z	0.60	Z
R	Y – Z	1.05	Z

Table 3
Jadual 3

Which of the following arrangements of metals X, Y and Z is in descending order of electropositivity in the electrochemical series?
Antara berikut yang manakah susunan logam X,Y dan Z mengikut tertib elektropositif menurun dalam siri elektrokimia?

- A Z, X, Y
 B Z, Y, X
 C X, Y, Z
 D X, Z, Y

43. Diagram 15 shows curve W obtained from the decomposition of 20 cm^3 of 0.40 mol dm^{-3} hydrogen peroxide solution, H_2O_2 , using 0.2 g of manganese (IV) oxide as catalyst at a temperature of 30°C .
Rajah 15 menunjukkan lengkung W terbentuk daripada penguraian 20 cm^3 larutan hidrogen peroksida 0.40 mol dm^{-3} , di mangkinkan oleh mangan(IV) oksida pada suhu 30°C .

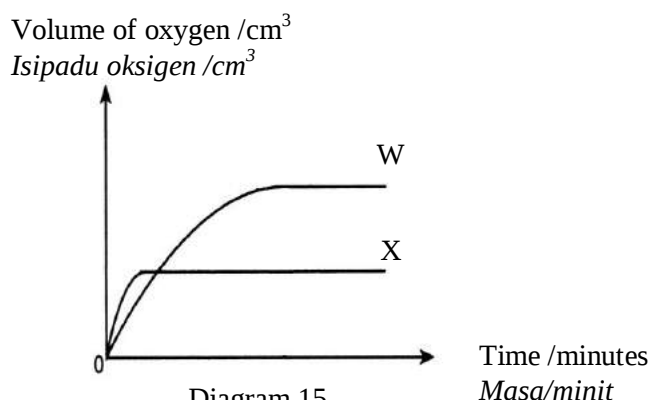


Diagram 15

Rajah 15

Which of the following experiments will produce curve X?

Antara eksperimen berikut yang manakah akan menghasilkan lengkung X?

	Volume of $\text{H}_2\text{O}_2 / \text{cm}^3$ <i>Isipadu $\text{H}_2\text{O}_2 / \text{cm}^3$</i>	Concentration of $\text{H}_2\text{O}_2 / \text{mol dm}^{-3}$ <i>Kepekatan $\text{H}_2\text{O}_2 / \text{mol dm}^{-3}$</i>	Temperature $^\circ\text{C}$ <i>Suhu $^\circ\text{C}$</i>
A	10	0.60	30
B	15	0.20	30
C	20	0.60	40
D	30	0.30	40

44. Table 4 shows the melting and boiling points of substances P, Q, R and S..
Jadual 4 menunjukkan takat lebur dan takat didih untuk bahan P, Q, R dan S..

Substance <i>Bahan</i>	Melting point $^\circ\text{C}$ <i>Takat lebur $^\circ\text{C}$</i>	Boiling point $^\circ\text{C}$ <i>Takat didih $^\circ\text{C}$</i>
P	-59	60
Q	48	130
R	-110	-70
S	128	470

Table 4

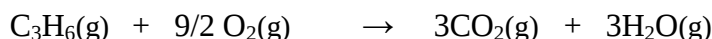
Jadual 4

Which of the following substances has the highest kinetic energy at room temperature?

Antara bahan berikut yang manakah mempunyai tenaga kinetik yang paling tinggi pada suhu bilik?

- A P
 B Q
 C R
 D S

45. The following equation shows the complete combustion of propene gas.
Persamaan berikut menunjukkan pembakaran gas propene



Which of the following statements are true when 1 mol of propene gas is burnt completely?

[Relative molecular mass : $\text{C}_3\text{H}_6 = 42$, $\text{O}_2 = 32$, $\text{CO}_2 = 44$, $\text{H}_2\text{O} = 18$, Molar volume of gas is $22.4 \text{ dm}^3 \text{ mol}^{-1}$ at S.T.P.]

Yang manakah antara pernyataan berikut adalah benar apabila 1 mol gas propene terbakar secara lengkap?

[Jisim molekul relatif : $\text{C}_3\text{H}_6 = 42$, $\text{O}_2 = 32$, $\text{CO}_2 = 44$, $\text{H}_2\text{O} = 18$, Isi padu molar gas $22.4 \text{ dm}^3 \text{ mol}^{-1}$ pada S.T.P.]

- I Complete combustion of 0.1 mol of propene produces 5.4 g of water
Pembakaran lengkap 0.1 mol gas propena menghasilkan 5.4 g air
- II Complete combustion of 1 mol of propene gas produces 2 mol of water
Pembakaran lengkap 1 mol gas propene menghasilkan 2 mol air
- III Complete combustion of 4.2 g of propene requires 14.4 g of oxygen.
Pembakaran lengkap 4.2 g gas propena memerlukan 14.4 g gas oksigen
- IV Complete combustion of 0.1 mol of propene produces 6.72 dm^3 carbon dioxide gas at s.t.p.
Pembakaran lengkap 0.1 mol propena akan menghasilkan 6.72 dm^3 gas karbon dioksida pada s.t.p
- A I and II only
B I and IV only
C II and IV only
D I, III and IV
46. Ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$ is an example of a fertilizer.
Calculate the percentage of nitrogen in 1 mole of ammonium sulphate.
[Relative atomic mass: N=14, H=1, S=32, O=16]
- Ammonium sulfat, $(\text{NH}_4)_2\text{SO}_4$ adalah satu contoh baja.
Hitungkan peratus nitrogen dalam 1 mol ammonium sulfat.
[Jisim atom relatif: N=14, H=1, S=32, O=16]*
- A 12.12 %
B 21.21 %
C 23.23 %
D 31.31 %

47. Diagram 16 shows the preparation of lead(II) chloride salt.
Rajah 16 menunjukkan persediaan garam plumbum(II) klorida.

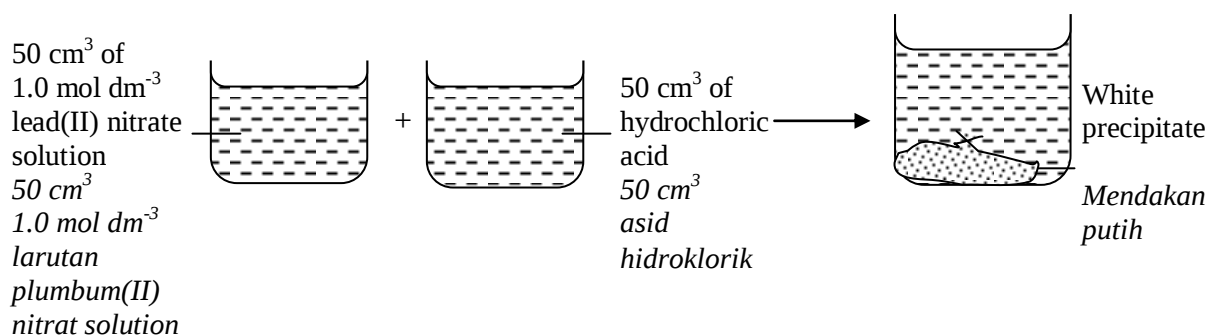


Diagram 16
Rajah 16

- What is the concentration of the hydrochloric acid needed to react completely with lead(II) nitrate solution?
Berapakah kepekatan larutan asid hidroklorik yang diperlukan untuk bertindak balas lengkap dengan larutan plumbum(II) nitrat?
- A 0.5 mol dm⁻³
 B 1.0 mol dm⁻³
 C 1.5 mol dm⁻³
 D 2.0 mol dm⁻³
48. Which of the following food additives can be used to make food stay fresh longer and taste better?
Antara bahan tambah makanan berikut yang manakah boleh digunakan untuk mengekalkan kesegaran makanan dan meningkatkan rasanya?
- A Sodium benzoate and tartrazine
Natrium benzoat dan tartrazina
 B Sodium benzoate and ascorbic acid
Natrium benzoat dan asid askorbik
 C Monosodium glutamate and tartrazine
Mononatrium glutamat dan tartrazina
 D Ascorbic acid and monosodium glutamate
Asid askorbik dan mononatrium glutamat

- 49 Diagram 17 shows the process to produce compound J.
Rajah 17 menunjukkan proses menghasilkan sebatian J.

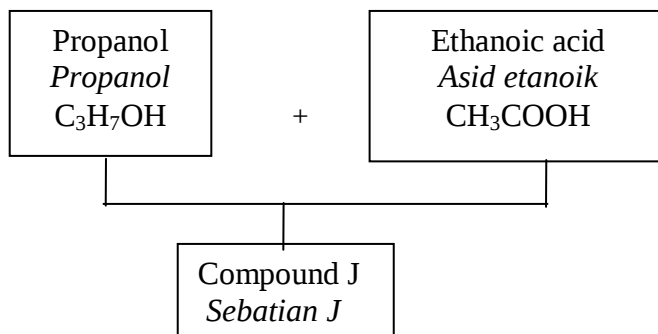


Diagram 17
Rajah 17

Which of the following structural formulas is of compound J?
Antara formula struktur yang manakah bagi sebatian J?

- A
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{C} - \text{O} - \text{CH}_2 - \text{CH}_3 \end{array}$$
- B
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{C} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \end{array}$$
- C
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{CH}_2 - \text{C} - \text{O} - \text{CH}_2 - \text{CH}_3 \end{array}$$
- D
$$\begin{array}{c} \text{O} \\ || \\ \text{CH}_3 - \text{CH}_2 - \text{C} - \text{O} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \end{array}$$

- 50 Diagram 18 shows the set of apparatus of an experiment to investigate electron transfer at a distance.
Rajah 18 menunjukkan susunan radas satu eksperimen pemindahan elektron pada satu jarak.

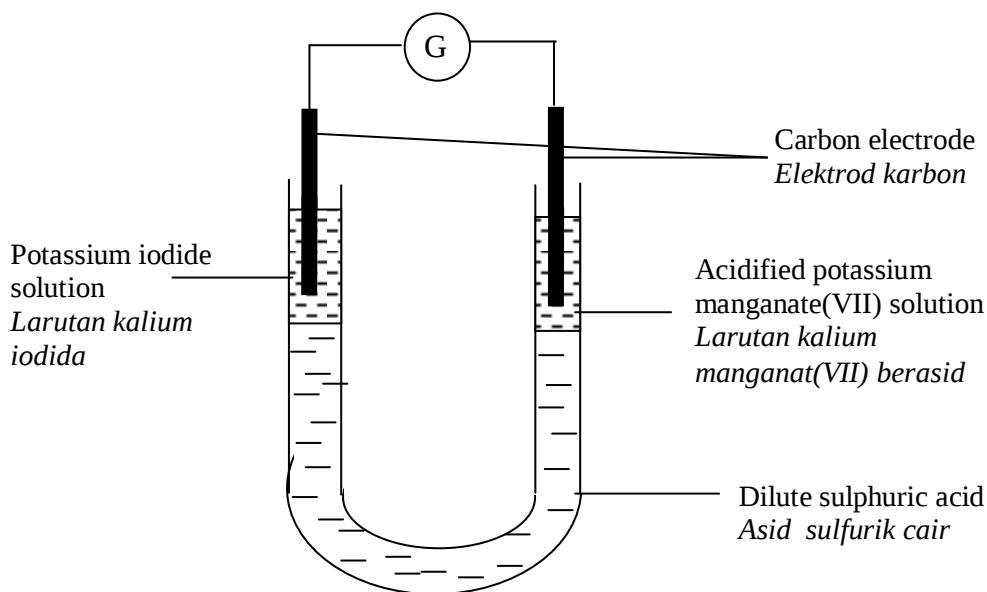


Diagram 18
Rajah 18

Which of the following statements is true about the experiment?
Antara pernyataan berikut yang manakah benar tentang eksperimen itu?

- A Iodide ion is the reducing agent
Ion iodida bertindak sebagai agen penurunan.
- B Oxidation number of iodine decreases from 0 to -1
Nombor pengoksidaan iodin menurun dari 0 ke -1
- C Oxidation number of manganese increases from +2 to +7
Nombor pengoksidaan mangan bertambah dari +2 ke +7
- D Electrons flow from potassium iodide solution to acidified potassium manganate(VII) through sulphuric acid
Elektron mengalir dari larutan kalium iodida ke larutan kalium manganat(VII) berasid melalui asid sulfurik

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