

1. Antara berikut bahan manakah merupakan unsur?
Which of the following is an element?
 - A Ammonia
Ammonia
 - B Metana
Methane
 - C Naftalena
Naphthalene
 - D Oksigen
Oxygen

2. Antara berikut yang manakah kegunaan kobalt-60?
Which of the following is a use of cobalt-60?
 - A Menganggar umur bahan fosil.
Estimate the age of fossils.
 - B Mengkaji metabolisme tumbuhan
Investigate the metabolism in plants.
 - C Mensterilkan alat pembedahan
Sterilize surgical instruments
 - D Merawat penyakit tiroid
Treating thyroid disease

3. Antara berikut yang manakah kegunaan unsur kumpulan 18?
Which of the following is uses of group 18 elements?
 - A Helium digunakan dalam lampu rumah api.
Helium used in lighthouse lamps.
 - B Neon digunakan di dalam lampu papan iklan.
Neon used in advertising board lights.
 - C Krypton digunakan dalam peluntur pakaian.
Krypton used in clothes bleach.
 - D Xenon digunakan di dalam belon kaji cuaca
Xenon used in weather balloons.

4. Antara berikut, yang manakah **benar** tentang sifat oksida unsur apabila merentasi kala 3?
*Which of the following is **true** about the properties of oxide when going across period 3?*

- A** Na_2O merupakan oksida bes.
 Na_2O are basic oxide.
- B** Al_2O_3 merupakan oksida asid.
 Al_2O_3 is an acidic oxide.
- C** SiO_2 merupakan oksida bes
 SiO_2 is a basic oxide.
- D** MgO merupakan oksida asid
 MgO is an acidic oxide.

5. Sebati Z mempunyai sifat-sifat berikut.
Compound Z has the following properties.

- Takat lebur dan takat didih yang tinggi
High melting and boiling point
- Larut dalam air tetapi tak larut dalam pelarut organik
Soluble in water in water but insoluble in organic solvents.

Apakah Z?

What is Z?

- A** Asetamida
Acetamide
- B** Naftalena
Naphtalene
- C** Natrium klorida
Sodium chloride
- D** Karbon dioksida
Carbon monoxide
6. Ion kalium dan atom kalium mempunyai bilangan zarah subatom yang berbeza. Antara berikut yang manakah betul mengenai ion kalium berbanding atom kalium?
Potassium ion and potassium atom have different number of subatomic particles. Which of the following is correct about potassium ion compared to potassium atom?
- A** Bilangan neutron yang lebih
More number of neutron
- B** Bilangan elektron yang kurang
Less number of electron
- C** Nombor proton yang lebih besar
Bigger proton number
- D** Nombor nukleon yang lebih kecil
Smaller nucleon number

7. Antara bahan-bahan berikut yang manakah mengion separa lengkap dalam air?
Which of the following substances ionise partially in water?
- A Asid nitrik
Nitric acid
 - B Asid etanoik
Ethanoic acid
 - C Hidrogen klorida
Hydrogen chloride
 - D Natrium hidroksida
Sodium hydroxide
8. Antara berikut, manakah garam yang larut dalam air?
Which of the following salt is soluble in water?
- A Kalium nitrat
Potassium nitrate
 - B Barium sulfat
Barium sulphate
 - C Argentum karbonat
Silver carbonate
 - D Plumbum(II) klorida
Lead(II) chloride
9. Antara berikut, manakah merupakan tindak balas cepat?
Which of the following is fast reaction?
- I Pereputan buah
Fruit decay
 - II Pembakaran gas
Combustion of gases
 - III Nyalaan mancis
Ignition of matches
 - IV Penapaian
Fermentation
- A I dan II
I and II
 - B II dan III
II and III
 - C III dan IV
III and IV
 - D I dan IV
I and IV

10. Apakah maksud kadar tindak balas pada masa tertentu?
What is the meaning of instantaneous rate of reaction?
- A Kadar tindak balas yang berlaku pada satu ketika sahaja.
Rate of reaction at a particular point of time.
 - B Perubahan kuantiti bahan tindak balas per unit masa
Changes in the quantity of the reactant per unit time.
 - C Perubahan kuantiti hasil tindak balas per unit masa
Changes in the quantity of the product per unit time.
 - D Kadar tindak balas yang berlaku pada satu ketika dalam tindak balas.
Rate of reaction that occur at particular point in the reaction.
11. Antara bahan komposit berikut yang manakah mengandungi campuran gentian kaca silika, salutan kaca dan plastik.
Which of the following composite materials contains a mixture of silica glass fiber, glass coating and plastic.
- A Kaca fotokromik
Photochromic glass
 - B Kaca gentian
Fibre glass
 - C Gentian optik
Fibre optic
 - D Superkonduktor
Superconductor

12. Jadual 1 menunjukkan pernyataan ciri-ciri kaca Z.
Table 1 shows the statement of characteristics of Z glass.

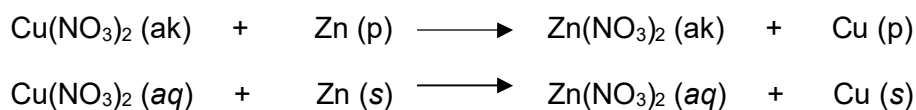
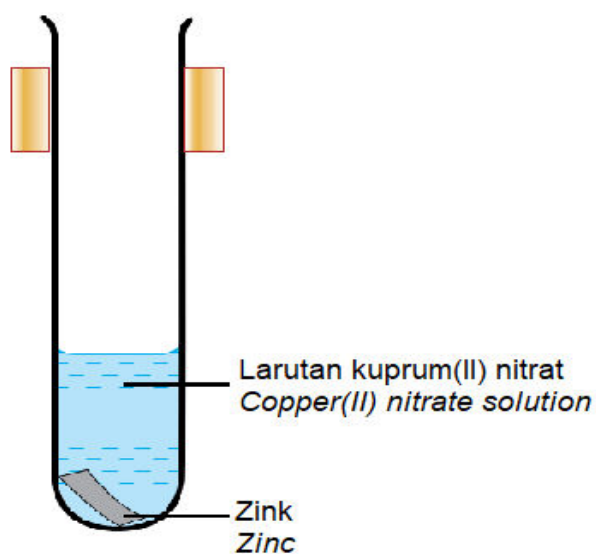
- Memerlukan suhu yang tinggi untuk melebur
Requires a high temperature to melt
- Tidak mengecut atau mengembang dengan perubahan suhu yang besar.
Does not shrink or expand with large temperature changes.
- Digunakan untuk membuat kanta teleskop
Used to make telescope lenses

Jadual/ Table 1

Apakah kaca Z?
What is Z glass?

- A** Silika terlakur
Fused silica
- B** Soda kapur
Soda lime
- C** Borosilikat
Borosilicate
- D** Kristal plumbum
Lead crystal

13.



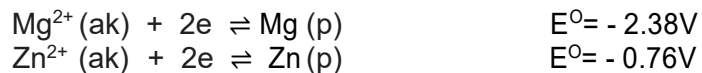
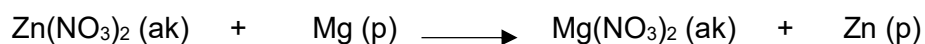
Rajah/ Diagram 1

Rajah 1 menunjukkan satu kepingan zink dimasukkan ke dalam tabung uji yang mengandungi larutan kuprum(II) nitrat. Antara perubahan nombor pengoksidaan berikut, manakah **betul** bagi kuprum.

*Diagram 1 shows a piece of zinc plate is added into a test tube containing copper(II) nitrate solution. Which of the following changes in oxidation number is **correct** for copper.*

- A 0 kepada +1
0 to +1
- B +1 kepada 0
+1 to 0
- C 0 kepada +2
0 to +2
- D +2 kepada 0
+2 to 0

14.



Persamaan berikut menunjukkan tindak balas penyesaran logam dan keupayaan elektrod piawai. Antara berikut yang manakah **benar** mengenai tindak balas tersebut?

*The following equation shows a displacement reaction of a metal and standard electrode potential. Which of the following statement is **true** about the reaction?*

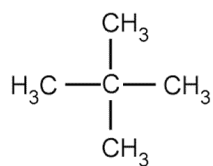
- A** Zink diturunkan
Zinc is reduced
- B** Magnesium diturunkan
Magnesium is reduced
- C** Logam zink lebih elektropositif daripada logam magnesium
Zinc metal more electropositive than magnesium metal
- D** Logam magnesium merupakan agen penurunan lebih kuat berbanding logam zink.
Magnesium metal is stronger reducing agents compared to zinc metal

- 15.** Etena bertindak balas dengan stim pada suhu 300°C untuk menghasilkan sebatian M. Asid fosforik pekat digunakan sebagai mangkin dalam tindak balas ini. Apakah M?
Ethene reacts with steam at the temperature of 300°C to produce compound M. Concentrated phosphoric acid is used as a catalyst in this reaction. What is M?

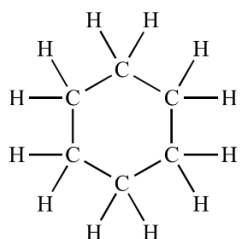
- A** C₂H₄
- B** C₂H₆
- C** C₂H₅OH
- D** C₂H₅COOH

16. Antara berikut, yang manakah merupakan hidrokarbon tepu?
Which of the following are saturated hydrocarbons?

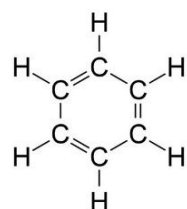
I



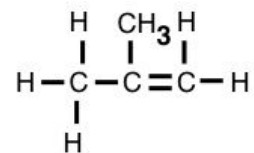
II



III

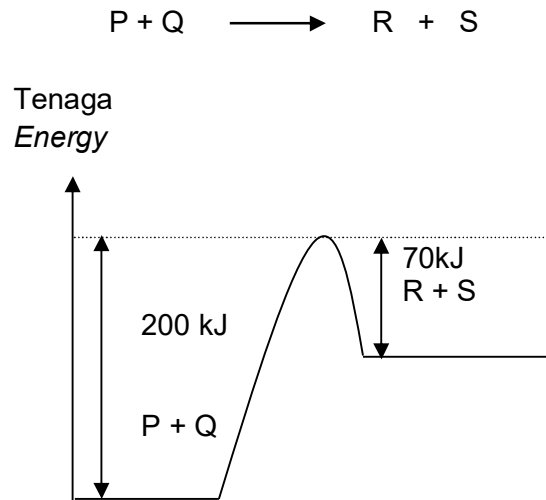


IV



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

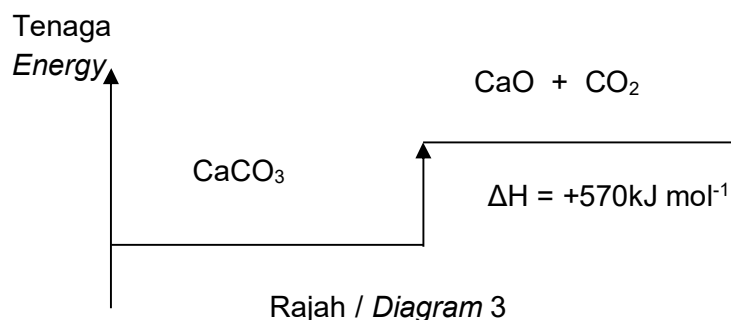
17. Rajah 2 menunjukkan gambarajah profil tenaga bagi tindak balas kimia berikut.
Diagram 2 shows the energy profile diagram of the following chemical reaction.



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

- A** Haba tindak balas bagi tindak balas ialah 70 kJ.
The heat of reaction is 70 kJ
- B** R dan S adalah lebih stabil daripada P dan Q.
R and S are more stable than P and Q.
- C** Tenaga pengaktifan bagi tindak balas adalah 200 kJ.
The activation energy of reaction is 200 kJ.
- D** Haba terbebas apabila P bertindak balas dengan Q untuk menghasilkan R dan S.
Heat is released when P reacts with Q to produce R and S.

18. Rajah 3 adalah gambar rajah aras tenaga bagi penguraian kalsium karbonat.
Diagram 3 is the energy level diagram for the decomposition of calcium carbonate.



Pernyataan manakah yang boleh dirumuskan daripada rajah 3?
Which statement can be deduced from the diagram 3?

- A** Haba diserap dalam tindak balas tersebut
Heat is absorbed in the reaction
- B** Tindak balas tersebut adalah eksotermik
The reaction is exothermic
- C** Jumlah tenaga bagi bahan tindak balas dan hasil tindak balas adalah 570 kJ
Total energy of the reactant and the products is 570 kJ
- D** Bahan tindak balas mempunyai lebih tenaga daripada hasil tindak balas
The reactant has more energy than the products
19. Polimer terdiri daripada polimer semulajadi dan polimer sintetik. Polimer semulajadi terhasil secara semulajadi manakala polimer sintetik dihasilkan oleh manusia melalui tindak balas kimia di makmal atau kilang-kilang. Antara berikut, manakah dipadankan dengan **betul**?
*Polymers can either be natural polymers or synthetic polymers. Natural polymer is naturally available while synthetic polymers are manmade through chemical reaction in laboratories or factories. Which of the following is **correctly** matched?*

	Sumber polimer <i>Source of polymer</i>	Polimer <i>Polymer</i>	Monomer <i>Monomer</i>
A	Sintetik <i>Synthetic</i>	Polistirena <i>Polystyrene</i>	Stirena <i>Styrene</i>
B	Sintetik <i>Synthetic</i>	Selulosa <i>Cellulose</i>	Glukosa <i>Glucose</i>
C	Semulajadi <i>Natural</i>	Getah asli <i>Natural rubber</i>	Neoprene <i>Neoprene</i>
D	Semulajadi <i>Natural</i>	Kanji <i>Starch</i>	Asid amino <i>Amino acid</i>

20. Antara berikut, yang manakah contoh polimer sintetik?
Which of the following is synthetic polymer?

- A Nilon
Nylon
- B Kanji
Starch
- C Protein
Protein
- D Selulosa
Cellulose

21. Air yang mengandungi ion kalsium, Ca^{2+} dan ion X^{2+} , disebut air liat.
Anion sabun bergabung dengan kation-kation tersebut untuk membentuk garam yang tidak larut di dalam air, iaitu kekat.
Water containing calcium ions, Ca^{2+} and X^{2+} ions, is called hard water.
Soap anions combine with the cations to form insoluble salts called scum.

Antara formula kimia berikut, manakah yang menunjukkan formula kimia bagi kekat untuk ion X selepas bertindak balas dengan natrium laurat?

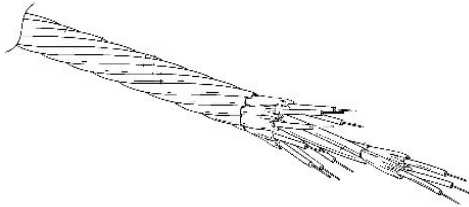
Which of the chemical formulae of the scum after reacted with sodium laurate?

- A $[\text{CH}_3 (\text{CH}_2)_{10} \text{COO}]_2 \text{Ca}$
- B $[\text{CH}_3 (\text{CH}_2)_{16} \text{COO}]_2 \text{Pb}$
- C $[\text{CH}_3 (\text{CH}_2)_{16} \text{COO}]_2 \text{Zn}$
- D $[\text{CH}_3 (\text{CH}_2)_{10} \text{COO}]_2 \text{Mg}$

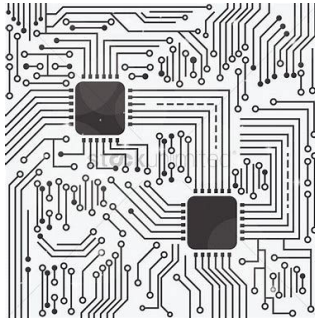
22. Superkonduktor seperti seramik itrium barium kuprum oksida, YBCO merupakan bahan komposit yang memiliki sifat superkonduktiviti. Magnet superkonduktor ringan dan mempunyai daya magnet yang sangat kuat. Antara berikut, yang manakah merupakan contoh kegunaan magnet superkonduktor?

Superconductors such as ceramic itrium barium copper oxide, YBCO is a composite material that possesses superconductivity properties. Superconductor magnets are lightweight and have a very strong magnetic force. Which of the following is an example of the use of superconductor magnets?

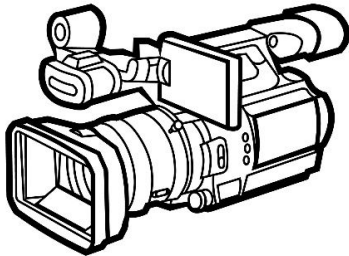
A



B



C



D



23. Antara sebatian berikut yang manakah mengandungi 2.4 dm³ isipadu gas pada suhu dan tekanan bilik.
Which of the following compounds contains 2.4 dm³ volume of gas at room temperature and pressure.

[Jisim atom relatif: H=1, C=12, O=16, N=14 dan 1 mol gas menempati isipadu sebanyak 24 dm³ pada suhu dan tekanan bilik]
[Relative atomic masses: H=1, C=12, O=16, N=14 and 1 mole of gas occupies a volume of 24 dm³ at room temperature and pressure]

- I 0.8 g CH₄
- II 1.7 g NH₃
- III 2.2 g CO₂
- IV 4.6 g NO₂
- A I dan II
I and II
- B I dan III
I and III
- C II dan IV
II and IV
- D III dan IV
III and IV

24. Persamaan kimia berikut menunjukkan tindak balas penguraian argentum nitrat apabila dipanaskan pada suhu dan tekanan bilik
The following chemical equation shows the decomposition reaction of argentum nitrate when heated at room temperature and pressure



Antara berikut yang manakah **benar** apabila 1 mol argentum nitrat terurai?
*Which of the following is **true** when 1 mole of silver nitrate decomposes?*

[Jisim atom relatif: O=16, Ag=207, N=14, pemalar Avogadro = 6.02 x 10²³ mol⁻¹ dan 1 mol gas menempati isipadu sebanyak 24 dm³ pada suhu dan tekanan bilik]
[Relative atomic masses: O=16, Ag=207, Avogadro constant = 6.02 x 10²³ mol⁻¹ and 1 mole of gas occupies a volume of 24 dm³ at room temperature and pressure]

- A 1 mol argentum oksida terhasil
1 mole of silver oxide is produced
- B 12 dm³ gas oksigen terbebas
12 dm³ of oxygen gas is released
- C 6.02 x 10²³ molekul gas nitrogen dioksida terbebas
6.02 x 10²³ molecules of nitrogen dioxide gas are released
- D 430 g argentum oksida terhasil
430 g of argentum oxide is produced

25. Jadual 2 menunjukkan nombor proton dan bilangan neutron bagi atom A
Table 2 shows the proton number and number of neutrons for atom A

Atom <i>Atom</i>	Nombor proton <i>Proton number</i>	Bilangan neutron <i>Number of neutron</i>
A	17	18

Jadual/Table 2

Antara berikut yang manakah betul bagi perwakilan piawai bagi atom A?
Which of the following is correct for the standard representation of atom A?

- A $^{17}_{35}\text{A}$
- B $^{18}_{35}\text{A}$
- C $^{35}_{18}\text{A}$
- D $^{35}_{17}\text{A}$

27. Jadual 3 menunjukkan maklumat bagi unsur X, Y dan Z.
Table 3 shows the information of elements X, Y and Z.

Unsur <i>Element</i>	X	Y	Z
Nombor proton <i>Proton number</i>	Kurang daripada 12 <i>Less than 12</i>	12	Lebih daripada 12 <i>More than 12</i>
Takat lebur (°C) <i>Melting point (°C)</i>	1285	650	839
Formula klorida <i>Formula of chloride</i>	XCl_2	YCl_2	ZCl_2
Formula oksida <i>Formula of oxide</i>	XO	YO	ZO

Jadual/ Table 3

Pernyataan manakah yang **betul**?

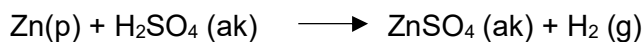
*Which statement is **correct**?*

- A** Jisim atom relatif berkurang dari unsur X, Y dan Z.
The relative atomic mass decrease from element X, Y and Z.
- B** Unsur X, Y dan Z menunjukkan sifat kimia yang sama
Elements X, Y and Z show similar chemical properties
- C** Unsur X, Y and Z larut dalam air untuk menghasilkan larutan berasid
Elements X, Y and Z dissolve in water to produce acidic solution
- D** Pepejal hitam terbentuk apabila unsur X, Y dan Z bertindak balas dengan oksigen
Black solid is formed when elements X, Y and Z react with oxygen
28. Antara bahan-bahan berikut, yang manakah boleh bertindak balas dengan asid etanoik glasial?
Which of the following substances can react with glacial ethanoic acid?
- A** Serbuk zink
Zinc powder
- B** Magnesium oksida
Magnesium oxide
- C** Serpihan kalsium karbonat
Calcium carbonate chips
- D** Larutan natrium karbonat
Sodium carbonate solution

29. Antara berikut, yang manakah akan menghasilkan kuprum(II) sulfat ?
Which of the following reaction will produce copper(II) sulphate, CuSO₄?
- A Kuprum dan asid sulfurik
Copper *and* sulphuric acid
 - B Kuprum(II) oksida dan asid sulfurik
Copper(II) oxide *and* sulphuric acid
 - C Kuprum(II) nitrat dan asid sulfurik
Copper(II) nitrate *and* sulphuric acid
 - D Kuprum (II) klorida dan asid sulfurik
Copper(II) chloride *and* sulphuric acid
30. Apakah perubahan yang dapat diperhatikan dan diukur untuk menentukan kadar tindak balas bagi persamaan kimia berikut?
What is the observable and measurable changes to determine the rate of reaction for the chemical equation?
- $$2\text{HCl(ak)} + \text{CaCO}_3 (\text{p}) \longrightarrow \text{CaCl}_2 (\text{ak}) + \text{H}_2\text{O(ce)} + \text{CO}_2 (\text{g})$$
- $$2\text{HCl(aq)} + \text{CaCO}_3 (\text{s}) \longrightarrow \text{CaCl}_2 (\text{aq}) + \text{H}_2\text{O(l)} + \text{CO}_2 (\text{g})$$
- A Pertambahan isi padu air, H₂O terhasil per unit masa.
The increase in the volume of water, H₂O per unit time.
 - B Pengurangan isi padu asid hidroklorik, HCl per unit masa.
The decrease in the volume of hydrochloric acid, HCl per unit time.
 - C Pertambahan isi padu kalsium klorida, CaCl₂ terhasil per unit masa.
The increase in the volume of calcium chloride, CaCl₂ per unit time.
 - D Pertambahan isi padu gas karbon dioksida, CO₂ terhasil per unit masa.
The increase in the volume of carbon dioxide gas, CO₂ per unit time.

31. Persamaan kimia di bawah menunjukkan satu tindak balas antara logam reaktif dan satu asid.

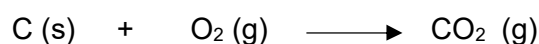
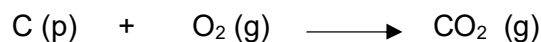
Chemical equation below shows a reaction between reactive metal and an acid.



Apakah kaedah untuk meningkatkan kadar tindak balas tersebut?

Which method will increase the rate of reaction?

- A Menggunakan magnesium menggantikan zink.
Used magnesium instead of zinc.
 - B Menggantikan asid sulfurik dengan asid hidroklorik.
Replace sulphuric acid with hydrochloric acid.
 - C Menggunakan ferum sebagai mangkin dalam tindak balas.
Used iron as catalyst in the reaction.
 - D Menggunakan asid pada suhu bilik berbanding menggunakan asid pada suhu 40.0°C .
Used acid at room temperature instead of using acid at 40.0°C .
32. Persamaan kimia di bawah menunjukkan tindak balas antara karbon, C dan oksigen, O_2 yang menghasilkan karbon dioksida, CO_2 .
Chemical reaction below shows the reaction between carbon, C and oxygen, O_2 to produce carbon dioxide, CO_2 .

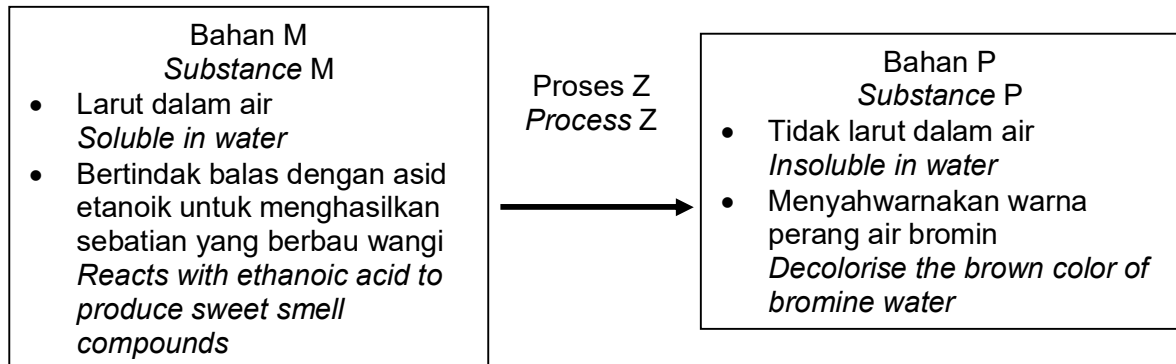


Berdasarkan persamaan diberi, pernyataan manakah yang **benar**?

*Based on equation given, which statement is **true**?*

- A Agen penurunan: Oksigen, O_2 kerana telah mengoksidakan karbon, C
Reducing agent: Oxygen, O_2 because oxidises carbon, C
- B Agen pengoksidaan: Karbon, C kerana telah menurunkan oksigen, O_2
Oxidation agent: Carbon, C because reduces O_2
- C Bahan diturunkan: Oksigen, O_2 kerana nombor pengoksidaan bertambah
Reduced substance: Oxygen, O_2 because oxidation number increases
- D Bahan dioksidakan: Karbon, C kerana nombor pengoksidaan bertambah
Oxidised substance: Karbon, C because oxidation number increases

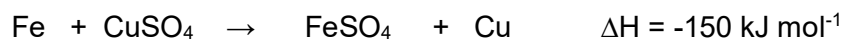
33. Rajah 5 menunjukkan perubahan bahan M kepada bahan P melalui proses Z
Diagram 5 shows the changes of substance M to substance P through process Z



Rajah/ *Diagram 5*

Antara berikut, yang manakah **betul** tentang proses Z?
*Which of the following is **correct** about process Z?*

- A** Dialirkan melalui serpihan porselin panas
Passes through hot porcelain chips
- B** Distim pada suhu 300°C dengan asid fosforik
Steamed at 300°C with phosphoric acid
- C** Bertindak balas dengan hidrogen klorida pada suhu bilik
Reacts with hydrogen chloride at room temperature
- D** Dipanaskan pada suhu 180°C dengan nikel
Heated at 180°C with nickel
34. Berikut ialah suatu persamaan termokimia.
The following is a thermochemical equation.



Berapakah perubahan haba apabila 3.2 g kuprum terbentuk dalam tindak balas ini?

[Jisim atom relatif: Cu = 64]

What is the heat change when 3.2 g copper is formed in this reaction?

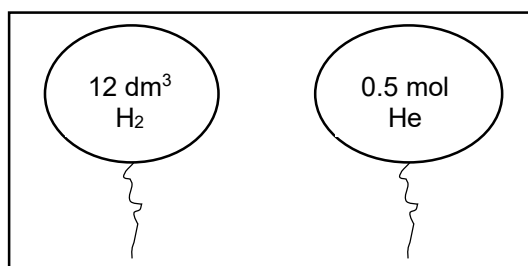
[*Relative atomic mass: Cu = 64*]

- A** 0.13 kJ
- B** 1.37 kJ
- C** 7.50 kJ
- D** 3000 kJ

35. Pembakaran sempurna bagi 1 mol propanol, $\text{C}_3\text{H}_7\text{OH}$, menghasilkan 2010 kJ haba. Kira jisim propanol, $\text{C}_3\text{H}_7\text{OH}$ yang diperlukan untuk membakar lengkap dalam oksigen bagi meningkatkan suhu 250 cm^3 air sebanyak 31°C .
The complete combustion of 1 mole propanol $\text{C}_3\text{H}_7\text{OH}$, produces 2010 kJ of heat. Calculate the mass of propanol, $\text{C}_3\text{H}_7\text{OH}$ needed to burn completely in oxygen in order to raise the temperature of 250 cm^3 of water by 31°C .

[Muatan haba tentu larutan = $4.2\text{ J g}^{-1} ^\circ\text{C}^{-1}$; Jisim Molar $\text{C}_3\text{H}_7\text{OH}$ = 60 g mol^{-1}]
 [Specific heat capacity of a solution = $4.2\text{ J g}^{-1} ^\circ\text{C}^{-1}$; Molar mass of $\text{C}_3\text{H}_7\text{OH}$ = 60 g mol^{-1}]

- A 0.74 g
 B 0.78 g
 C 0.97 g
 D 1.95 g
36. Rajah 6 menunjukkan dua biji belon yang masing-masing mengandungi gas hidrogen dan gas helium.
Diagram 6 shows two balloons that each contain hydrogen gas and helium gas.



Rajah/Diagram 6

Berapakah bilangan mol gas hidrogen dan jisim gas helium yang terdapat di dalam setiap belon pada suhu dan tekanan bilik?

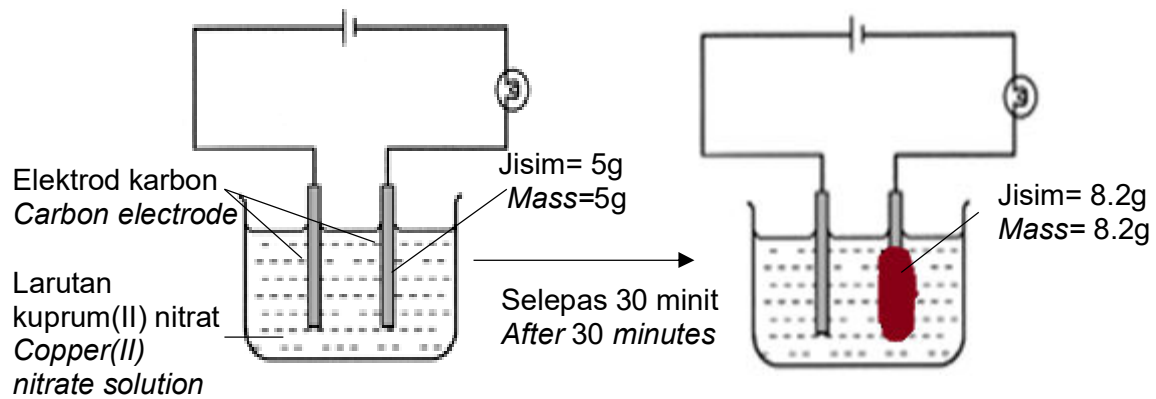
How many number of moles of hydrogen gas and how many number of atoms of helium gas are there in each balloon at room temperature dan pressure?

[Jisim atom relatif He = 4 dan 1 mol gas menempati isipadu sebanyak 24 dm^3 pada suhu dan tekanan bilik]

[Relative atomic mass He = 4 and 1 mole of gas occupies a volume of 24 dm^3 at room temperature and pressure]

	Gas hydrogen <i>Hydrogen gas</i>	Gas helium <i>Helium gas</i>
A	0.5 mol	2.0 g
B	0.5 mol	3.0 g
C	1.0 mol	0.5 g
D	1.0 mol	4.0 g

37. Rajah 7 menunjukkan keputusan suatu eksperimen sel elektrolisis.
Diagram 7 shows the results of an electrolysis cell experiment.



Rajah/Diagram 7

Berapakah bilangan atom kuprum yang terhasil pada elektrod katod.
How many number of copper atoms are produced at the cathode electrode?

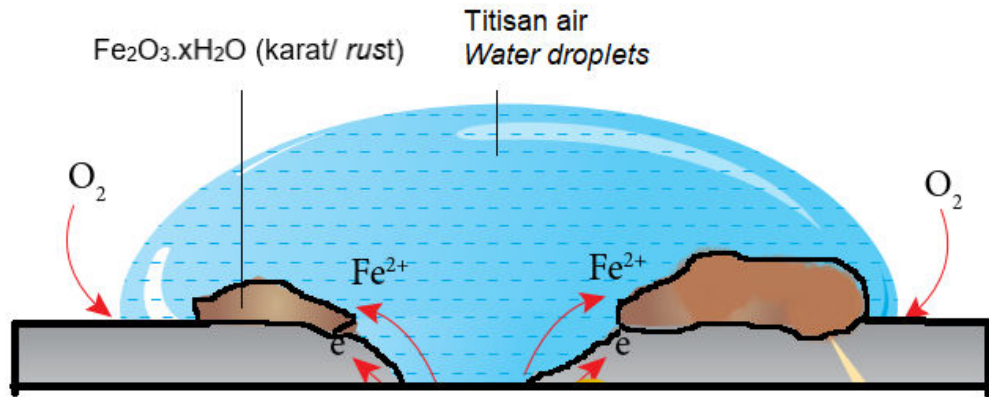
[Jisim atom relatif Cu = 64 dan pemalar Avogadro = $6.02 \times 10^{23} \text{ mol}^{-1}$]
 [Relative atomic mass Cu = 64 and Avogadro constant = $6.02 \times 10^{23} \text{ mol}^{-1}$]

- A 3.01×10^{22}
- B 4.70×10^{22}
- C 7.71×10^{22}
- D 1.24×10^{23}
38. Berapakah jisim natrium hidroksida diperlukan untuk menyediakan 250 cm^3 of 0.4 mol dm^{-3} larutan piawai sodium hidroksida?
What is the mass of sodium hydroxide needed to prepare 250 cm^3 of 0.4 mol dm^{-3} standard solution of sodium hydroxide?

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

- A 0.2 g
- B 0.4 g
- C 4.0 g
- D 40.0 g

39.



Rajah/ Diagram 8

Rajah 8 menunjukkan mekanisme pengkaratan besi.

Antara persamaan berikut, yang manakah mewakili tindak balas yang berlaku pada anod?

Diagram 8 show the mechanism of rusting.

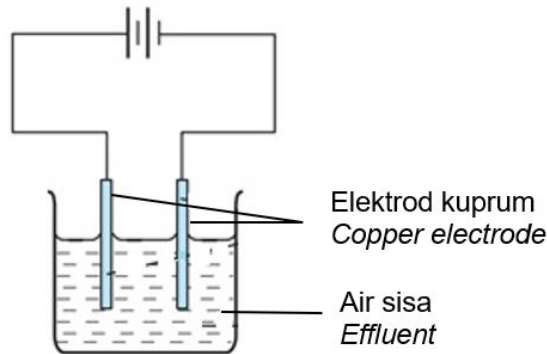
Which of the following equations represents the reaction that occurs at the anode?

- A** $\text{Fe}^{2+}(\text{ak}) + 2e^- \longrightarrow \text{Fe}(\text{p})$
 $\text{Fe}^{2+}(\text{aq}) + 2e^- \longrightarrow \text{Fe}(\text{s})$
- B** $\text{Fe}(\text{p}) \longrightarrow \text{Fe}^{2+}(\text{ak}) + 2e^-$
 $\text{Fe}(\text{s}) \longrightarrow \text{Fe}^{2+}(\text{aq}) + 2e^-$
- C** $\text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{ce}) + 4e^- \longrightarrow 4\text{OH}^-(\text{ak})$
 $\text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + 4e^- \longrightarrow 4\text{OH}^-(\text{aq})$
- D** $\text{Fe}^{2+}(\text{ak}) + 2\text{OH}^-(\text{ak}) \longrightarrow \text{Fe}(\text{OH})_2(\text{p})$
 $\text{Fe}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq}) \longrightarrow \text{Fe}(\text{OH})_2(\text{s})$

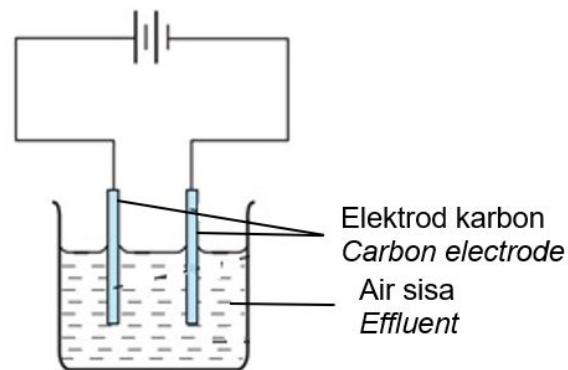
40. Kaedah Olahan Larutlesapan Tapak Pelupusan dilakukan menggunakan prinsip elektrolisis. Sebagai seorang jurutera kimia yang terlibat di dalam industri tekstil, anda diamanahkan untuk merawat air sisa daripada perusahaan batik. Berdasarkan pengetahuan anda menggunakan prinsip elektrolisis, yang manakah merupakan gambarajah susunan alat radas yang paling sesuai untuk mengasingkan logam berat yang terdapat di dalam air sisa tersebut?

Landfill Leachate Treatment Method is done by using the electrolysis principle. As a chemical engineer involved in textile industry, you are entrusted to treat effluent from batik company. Based on your knowledge by using electrolysis principle, which apparatus set up is most suitable to isolate heavy metal in the effluent?

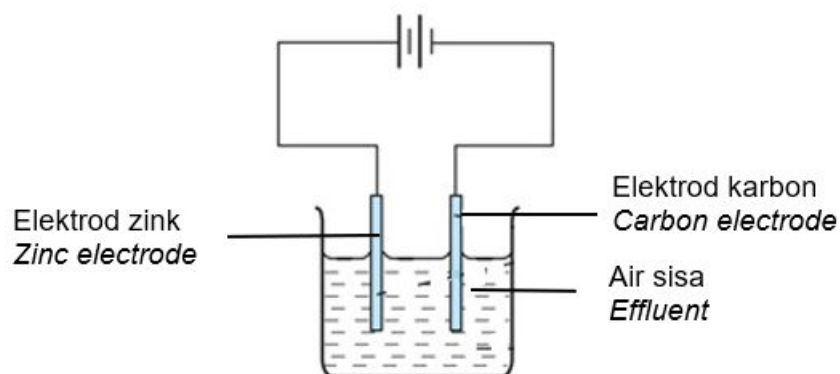
A



B



C



SOALAN TAMAT
END OF QUESTIONS