



Cambridge IGCSE™

CHEMISTRY

0620/11

Paper 1 Multiple Choice (Core)

October/November 2024

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Any blank pages are indicated.



2

- 1 The table shows the melting and boiling points of four elements.

Which element is a gas at room temperature and pressure?

	melting point/ $^{\circ}\text{C}$	boiling point/ $^{\circ}\text{C}$
A	-101	-35
B	-7	59
C	10	100
D	113	445

- 2 Four statements about the arrangement or movement of particles are given.

- 1 Particles are packed in a regular arrangement.
- 2 Particles are randomly arranged.
- 3 Particles move over each other.
- 4 Particles vibrate about fixed points.

Which statements describe the particles in a pure solid?

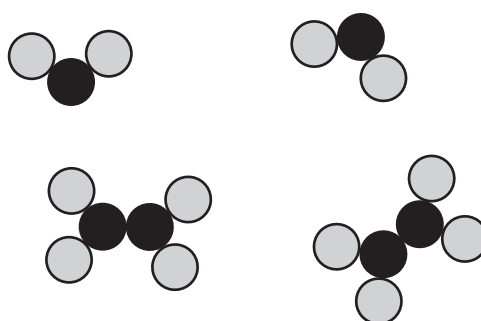
- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

- 3 One atom of an element contains 12 electrons, 12 protons and 13 neutrons.

How many nucleons does this atom contain?

- A** 12 **B** 13 **C** 24 **D** 25

- 4 A diagram representing a mixture of four particles is shown.



Which statement describes the mixture of particles?

- A** It is a mixture of two different compounds.
B It is a mixture of two different elements.
C It is a mixture of four different compounds.
D It is a mixture of four different elements.

- 5 Chlorine reacts with sodium to form sodium chloride.

What happens to the sodium atoms during this reaction?

- A They gain electrons to form anions.
- B They lose electrons to form anions.
- C They gain electrons to form cations.
- D They lose electrons to form cations.

- 6 Nitrogen monoxide, NO, is a simple molecular compound.

Which row shows the properties of nitrogen monoxide?

	boiling point	electrical conductivity
A	high	good
B	high	poor
C	low	good
D	low	poor

- 7 Metal X is in Group II of the Periodic Table.

X is reacted separately with dilute sulfuric acid and with oxygen.

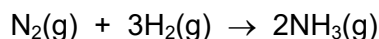
Which row identifies the products of each reaction?

	products with dilute sulfuric acid	product with oxygen
A	XSO ₄ and H ₂	XO
B	XSO ₄ and H ₂	XO ₂
C	X ₂ SO ₄ and H ₂	XO
D	X ₂ SO ₄ and H ₂	XO ₂

- 8 What is the relative molecular mass, M_r , of sulfuric acid, H₂SO₄?

- A 81
- B 82
- C 97
- D 98

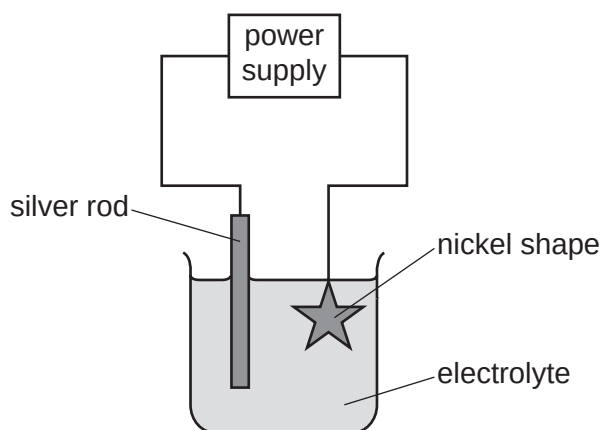
- 9 The equation for the production of ammonia, NH_3 , is shown.



Which mass of nitrogen is required to make 51 tonnes of ammonia?

- A** 21 tonnes **B** 25.5 tonnes **C** 42 tonnes **D** 84 tonnes

- 10 The diagram shows the apparatus used to electroplate a nickel shape with silver.



Which row identifies the negative electrode, the positive electrode and the electrolyte?

	negative electrode	positive electrode	electrolyte
A	silver rod	nickel shape	aqueous nickel nitrate
B	nickel shape	silver rod	aqueous silver nitrate
C	nickel shape	silver rod	aqueous nickel nitrate
D	silver rod	nickel shape	aqueous silver nitrate

- 11 Concentrated aqueous sodium chloride and dilute sulfuric acid are each electrolysed separately using inert electrodes.

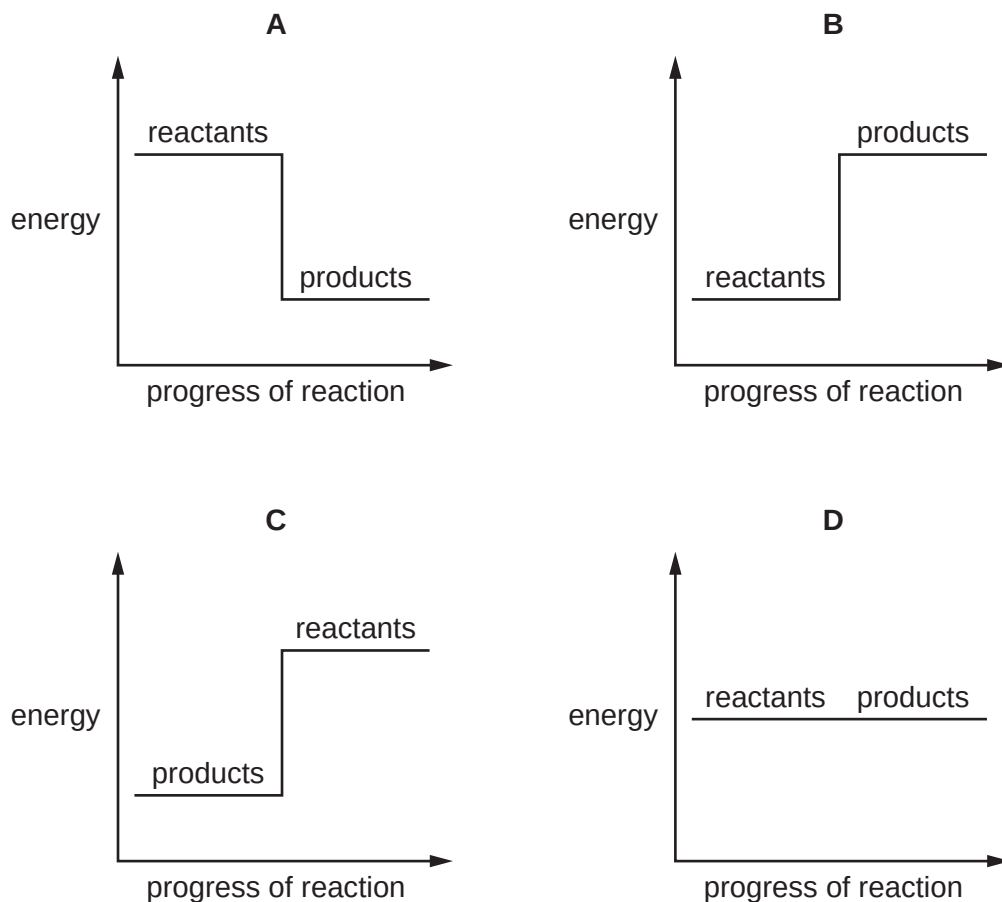
Three statements about the electrolysis of these electrolytes are listed.

- 1 A gas is produced at each electrode for both electrolytes.
- 2 Oxygen is produced at the cathode for both electrolytes.
- 3 Hydrogen is produced at the cathode for both electrolytes.

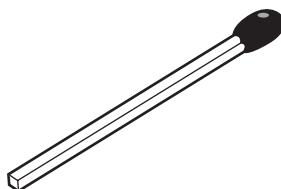
Which statements are correct?

- A** 1 and 3 **B** 1 only **C** 2 only **D** 3 only

12 Which reaction pathway diagram represents an endothermic reaction?



13 The diagram shows a match.

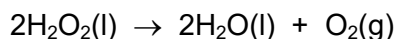


By striking the match, a chemical reaction takes place.

Which row describes the chemical reaction?

	type of reaction	reason
A	endothermic	because energy is given out as the match burns
B	endothermic	because energy is used to strike the match
C	exothermic	because energy is given out as the match burns
D	exothermic	because energy is used to strike the match

- 14 Hydrogen peroxide decomposes to form water and oxygen. The equation is shown.



Manganese(IV) oxide catalyses this reaction.

Which statements about manganese(IV) oxide are correct?

- 1 It increases the rate of the reaction.
- 2 It increases the total volume of oxygen gas produced at the end of the reaction.
- 3 It will have the same mass at the end of the reaction as it does at the start of the reaction.

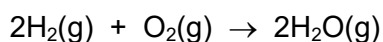
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

- 15 Four students collect the gas produced from the reaction of calcium carbonate with dilute hydrochloric acid. Each student records the time taken to collect a volume of gas.

Which results show the highest average rate of reaction?

- A** 15 cm³ of gas collected in 20 seconds
B 50 cm³ of gas collected in 40 seconds
C 75 cm³ of gas collected in 80 seconds
D 90 cm³ of gas collected in 100 seconds

- 16 The equation for the reaction between hydrogen and oxygen is shown.



Which statement explains why this is a redox reaction?

- A** Both oxidation and reduction take place.
B Heat energy is released to the surroundings.
C Hydrogen is a reactant.
D The reaction can be reversed.

- 17 Which statements about dilute ethanoic acid are correct?

- 1 It has a pH of 8.
- 2 It is an organic compound.
- 3 It turns universal indicator orange-yellow.
- 4 It reacts with magnesium to produce carbon dioxide.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

18 An aqueous solution of Z turns universal indicator paper purple.

Which row identifies the colour of methyl orange and of thymolphthalein when they are added separately to an aqueous solution of Z?

	methyl orange	thymolphthalein
A	yellow	blue
B	yellow	colourless
C	red	blue
D	red	colourless

19 Which row describes the solubility of lead(II) chloride and lead(II) sulfate in water?

	lead(II) chloride	lead(II) sulfate
A	soluble	soluble
B	soluble	insoluble
C	insoluble	soluble
D	insoluble	insoluble

20 Four different groups of oxides are shown.

- 1 MgO FeO CuO
- 2 CaO SO₂ TiO₂
- 3 PbO CaO Cl₂O
- 4 NO₂ Br₂O P₂O₅

Which statement about these groups of oxides is correct?

- A** 1, 2 and 3 contain basic oxides only.
- B** 2, 3 and 4 contain basic oxides only.
- C** 1 contains basic oxides only, and 4 contains acidic oxides only.
- D** 1 contains acidic oxides only, and 4 contains basic oxides only.

21 Four steps in the preparation of a soluble salt from a dilute acid and a solid metal oxide are listed.

- 1 Warm the dilute acid.
- 2 Evaporate the solution to half of its volume and allow to cool.
- 3 Add excess metal oxide.
- 4 Filter to remove any unreacted solid.

What is the correct order for these steps?

- A** 1 → 2 → 3 → 4
B 1 → 3 → 4 → 2
C 3 → 1 → 2 → 4
D 3 → 4 → 1 → 2

22 Which pair of elements react together most violently?

- A** chlorine and lithium
B chlorine and potassium
C iodine and lithium
D iodine and potassium

23 Rubidium is an element in Group I of the Periodic Table.

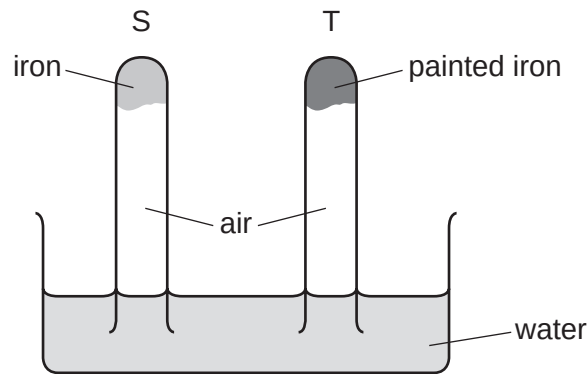
Which row describes a physical property and a chemical property of rubidium?

	physical property	chemical property
A	hard	reacts with water
B	hard	does not react with water
C	soft	reacts with water
D	soft	does not react with water

24 Which row describes the state and colour of bromine at room temperature and pressure?

	state	colour
A	liquid	red-brown
B	liquid	grey-black
C	solid	red-brown
D	solid	grey-black

30 The diagram shows an experiment to investigate how paint affects the rusting of iron.



What happens to the water level in tubes S and T?

	tube S	tube T
A	falls	rises
B	no change	rises
C	rises	falls
D	rises	no change

31 Which statement describes clean, dry air?

- A** It is a compound containing about 78% nitrogen and 21% oxygen only.
- B** It is a mixture of about 21% nitrogen and 78% oxygen only.
- C** It is a mixture of several gases, including nitrogen and oxygen.
- D** It is a compound containing nitrogen, oxygen, carbon dioxide and other gases.

32 Which word equation describes photosynthesis?

- A** carbon dioxide + water → glucose + oxygen
- B** glucose + water → carbon dioxide + oxygen
- C** carbon dioxide + oxygen → glucose + water
- D** glucose + oxygen → carbon dioxide + water

33 Some adverse effects caused by air pollutants are listed.

- acid rain
- photochemical smog
- respiratory problems

Which air pollutant contributes to **all three** of these adverse effects?

- A** carbon monoxide
B oxides of nitrogen
C methane
D particulates

34 Petroleum is an important raw material that is separated into useful products.

Which terms describe petroleum and the method used to separate it?

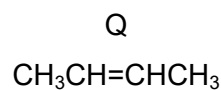
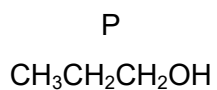
	description	separation method
A	compound	cracking
B	compound	fractional distillation
C	mixture	cracking
D	mixture	fractional distillation

35 Which statements about homologous series are correct?

- 1 All carboxylic acids have similar chemical properties.
- 2 All alcohols have the same molecular mass.
- 3 Ethane and ethene are members of the same homologous series.
- 4 Ethane and propane are members of the same homologous series.

- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

36 The formulae of two organic compounds, P and Q, are shown.



Which type of organic compounds are P and Q?

	P	Q
A	alcohol	alkane
B	alcohol	alkene
C	carboxylic acid	alkane
D	carboxylic acid	alkene

37 Which fuel is manufactured by fermentation?

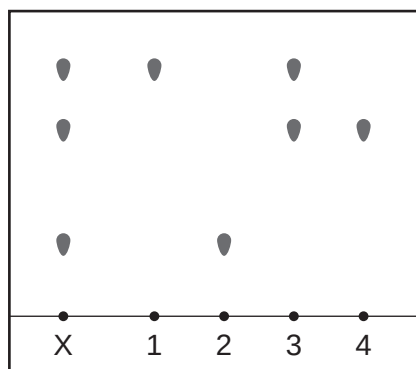
- A** diesel
- B** ethanol
- C** hydrogen
- D** kerosene

38 Which statement about the disposal of waste plastics is correct?

- A** They are put in landfill sites, where they quickly decompose.
- B** They are burned to produce non-toxic products.
- C** They accumulate in oceans, where they are harmful to aquatic life.
- D** They are dissolved in water and pumped into the sea.

39 Dyes are coloured substances.

The chromatogram of substance X and four different dyes, 1, 2, 3 and 4, is shown.



Substance X contains only **two** of the dyes 1, 2, 3 and 4.

Which **two** dyes are present in substance X?

- A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

40 The results of two tests on substance G are listed.

- A flame test produces a yellow flame.
- Substance G is added to aqueous sodium hydroxide and powdered aluminium and warmed carefully. A gas is given off which turns damp red litmus paper blue.

What is G?

- A** potassium chloride
B potassium nitrate
C sodium chloride
D sodium nitrate

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