

Cambridge IGCSE™

CHEMISTRY

0620/12

Paper 1 Multiple Choice (Core)

May/June 2026**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 or tape.
- Do **not** write on any bar codes.
- You may use a calculator.

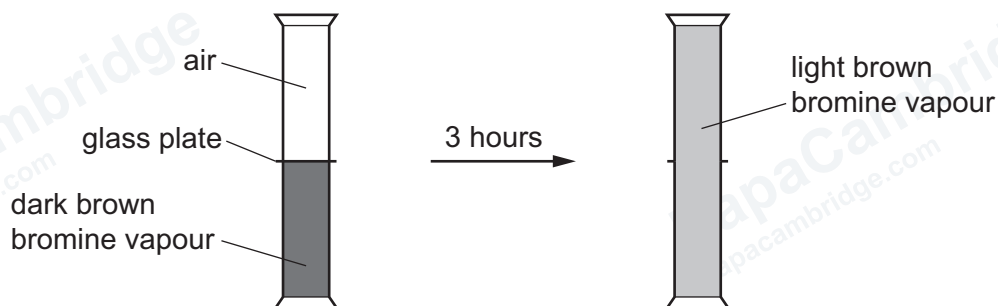
INFORMATION

- 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.

- 1 Two gas jars are arranged as shown.

The glass plate is removed and the jars allowed to stand for 3 hours.



Which statement explains the change in the gas jars after 3 hours?

- A Bromine has a greater density than air.
- B Bromine particles move from an area of high concentration to an area of low concentration.
- C Bromine particles move faster than the particles in air.
- D The particles in air are heavier than those in bromine.

- 2 What is the relative charge and the relative mass of an electron?

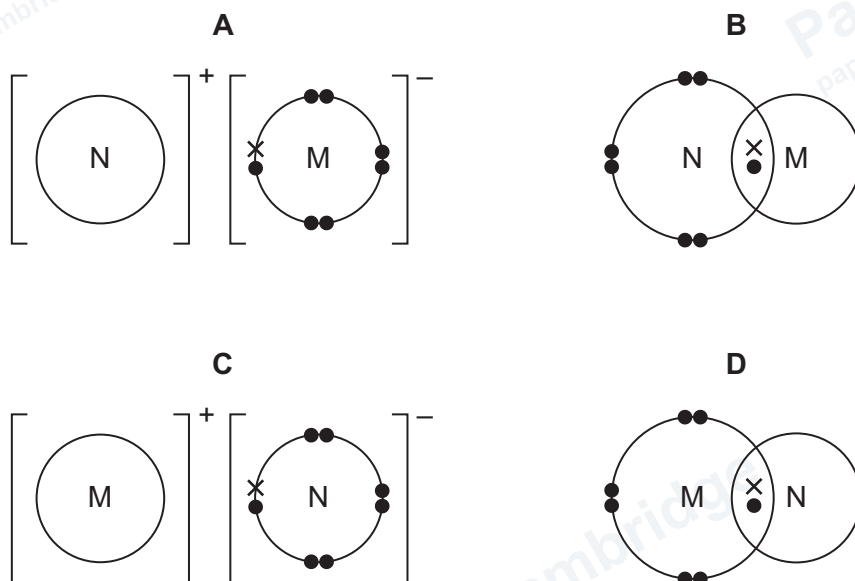
	relative charge	relative mass
A	-1	$\frac{1}{1840}$
B	0	1
C	+1	$\frac{1}{1840}$
D	-1	1

- 3 Which row identifies the particles present in the nucleus and in the shells of one atom of ${}^7_3\text{Li}$?

	particles present in the nucleus of one atom of ${}^7_3\text{Li}$	particles present in the shells of one atom of ${}^7_3\text{Li}$
A	3 protons and 4 neutrons	3 electrons
B	4 protons and 3 neutrons	4 electrons
C	3 electrons and 4 neutrons	3 protons
D	4 electrons and 3 neutrons	4 protons

- 4 Element M is in Group I and element N is in Group VII.

Which diagram represents the bond that forms when element M and element N react together?



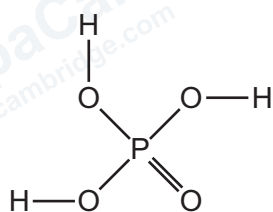
- 5 What is the total number of shared electrons in one molecule of ammonia?

A 2 **B** 4 **C** 6 **D** 8

- 6 Which use of graphite depends on the layers of carbon atoms being able to slide over each other?

A cutting tools
B electrodes
C jewellery
D lubricant

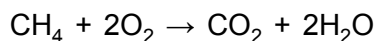
- 7 The diagram represents phosphoric acid.



What is the molecular formula for phosphoric acid?

A H_2PO_4 **B** HPO_4 **C** H_3PO_4 **D** $\text{P}(\text{OH})_4$

- 8 The equation for the complete combustion of methane, CH_4 , is shown.



160 g of methane is completely combusted in oxygen to form carbon dioxide and water only.

[M_r : CH_4 , 16; O_2 , 32; H_2O , 18]

Which row gives the mass of oxygen needed for complete combustion and the mass of water formed?

	mass of oxygen needed for complete combustion / g	mass of water formed / g
A	320	180
B	320	360
C	640	180
D	640	360

- 9 Four units are listed.

- 1 dm^3/mol
- 2 g/dm^3
- 3 mol/dm^3
- 4 g/mol

Which units are units of concentration?

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

- 10 Which row identifies the cathode, the anode and the electrolyte when nickel is electroplated with a thin layer of silver?

	cathode	anode	electrolyte
A	silver	nickel	aqueous silver nitrate
B	nickel	silver	aqueous silver nitrate
C	silver	nickel	aqueous nickel(II) nitrate
D	nickel	silver	aqueous nickel(II) nitrate

- 11** X is an insoluble binary compound.

In an experiment, X is electrolysed to form two elements.

Which statement describes X?

- A** X is a molten ionic compound.
- B** X is an aqueous ionic compound.
- C** X is a molten covalent compound.
- D** X is a solid covalent compound.

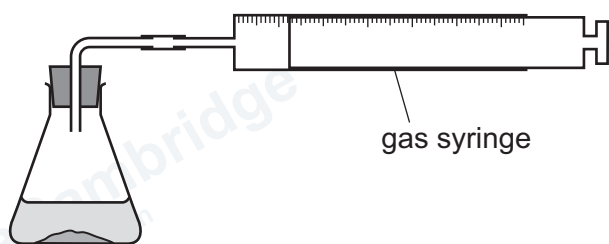
- 12** Which statement about a fuel cell in a car is correct?

- A** The fuel cell produces heat, which powers the car.
- B** The fuel cell is supplied with hydrogen directly from the air.
- C** The only emission from a fuel cell is nitrogen gas, which is non-polluting.
- D** The fuel cell produces electricity, which powers an electric motor.

- 13** Which statement describes an exothermic reaction?

- A** Thermal energy is transferred to the surroundings leading to a decrease in the temperature of the surroundings.
- B** Thermal energy is transferred to the surroundings leading to an increase in the temperature of the surroundings.
- C** Thermal energy is taken in from the surroundings leading to an increase in the temperature of the surroundings.
- D** Thermal energy is taken in from the surroundings leading to a decrease in the temperature of the surroundings.

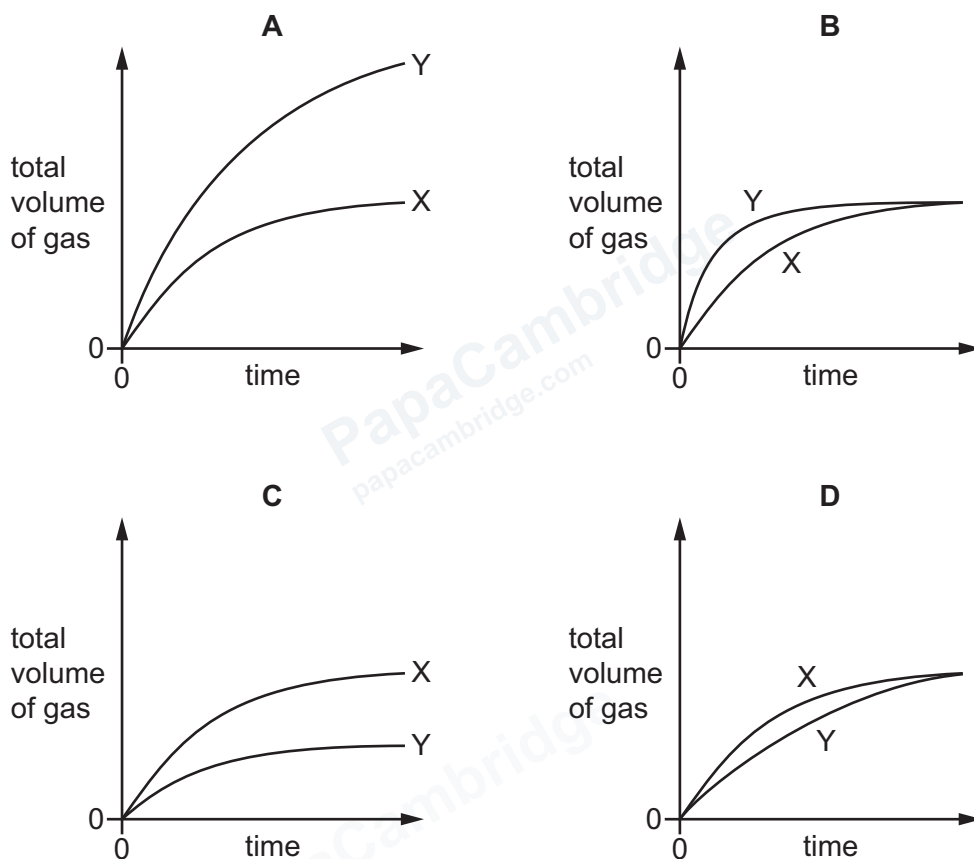
- 14 An experiment X is carried out between a solid and a solution using the apparatus shown.



The total volume of gas given off is measured at different times and the results plotted on a graph.

In a second experiment Y, the surface area of the solid is increased but all other factors remain the same.

Which graph shows the results of experiments X and Y?



- 15 What is shown by the symbol $\rightleftharpoons$ in the equation for a chemical reaction?

- A Heat is needed for the reaction to occur.
- B Water is needed for the reaction to occur.
- C A catalyst is needed to increase the rate of reaction.
- D The chemical reaction is reversible.

- 16 Farmers add calcium oxide (lime) and ammonium salts to their fields.

The compounds are **not** added at the same time because they react with each other.

Which gas is produced in this reaction?

- A ammonia
- B carbon dioxide
- C hydrogen
- D nitrogen

- 17 Which row identifies the universal indicator colour, pH and hydrogen ion concentration for the stated solution?

	description	universal indicator colour	pH	hydrogen ion concentration
A	strong alkali	blue	8	high
B	weak acid	blue	6	low
C	strong acid	red	1	high
D	weak alkali	yellow	5	low

- 18 Magnesium sulfate is a soluble solid which is formed when insoluble magnesium oxide reacts with dilute sulfuric acid.

Which method is used to prepare solid magnesium sulfate?

- A Excess sulfuric acid is reacted with magnesium oxide. The mixture is evaporated to dryness.
- B Excess sulfuric acid is reacted with magnesium oxide. The precipitate is filtered, washed and dried.
- C Sulfuric acid is reacted with excess magnesium oxide. The mixture is filtered and the filtrate is evaporated to dryness.
- D Sulfuric acid is reacted with excess magnesium oxide. The precipitate is filtered, washed and dried.

- 19 What is the charge on one ion of strontium, Sr?

- A 1+
- B 2+
- C 1–
- D 2–

20 Elements P, Q and R are three elements in Group I of the Periodic Table.

Element P has a lower density than element Q.

Element Q has a higher melting point than element R.

What are elements P, Q and R?

	element P	element Q	element R
A	lithium	sodium	potassium
B	sodium	potassium	lithium
C	lithium	potassium	sodium
D	potassium	lithium	sodium

21 Fluorine is the element above chlorine in Group VII of the Periodic Table.

Which statements about fluorine are correct?

- 1 Fluorine is a solid at room temperature and pressure.
- 2 Iodine displaces fluorine from aqueous potassium fluoride.
- 3 The formula of a fluorine molecule is F_2 .
- 4 The density of fluorine is lower than the density of chlorine.

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

22 Cobalt is a transition element.

What is a property of cobalt?

- A** It forms coloured compounds.
- B** It is a poor electrical conductor.
- C** It has a low density.
- D** It has a low melting point.

23 Which row identifies the properties that make aluminium useful as a food container?

key

✓ = yes

X = no

	low density	good electrical conductivity	high resistance to corrosion
A	✓	✓	X
B	✓	✓	✓
C	X	✓	X
D	X	X	✓

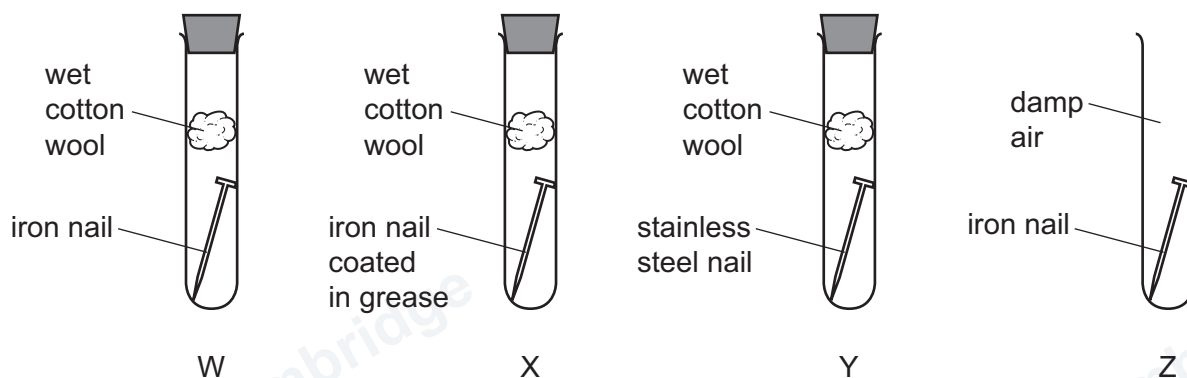
24 Which alkali and acid react to produce a salt in which both the cation and anion are used to make a fertiliser?

- A** ammonia and hydrochloric acid
- B** ammonia and nitric acid
- C** sodium hydroxide and hydrochloric acid
- D** sodium hydroxide and nitric acid

25 Which row identifies properties of zinc?

	reacts with dilute acid	thermal conductivity
A	no	poor
B	no	good
C	yes	poor
D	yes	good

26 A scientist investigates the rusting of nails using the apparatus shown.



The nails were left for 14 days.

Which statement is correct?

- A More rusting is shown in W than in X.
- B More rusting is shown in X than in Z.
- C More rusting is shown in Y than in Z.
- D More rusting is shown in Y than in W.

27 Which row identifies the ore of aluminium and describes its extraction method?

	ore	extraction method
A	bauxite	reduction with carbon
B	bauxite	electrolysis
C	hematite	reduction with carbon
D	hematite	electrolysis

28 Water from natural sources may contain substances such as metal compounds, dissolved oxygen, phosphates and plastics.

Which statement is correct?

- A Some metal compounds provide essential minerals for life.
- B Dissolved oxygen is always harmful to aquatic life.
- C Phosphates increase the oxygenation of the water.
- D Most plastics break down into harmless substances in water.

29 Which row identifies the source and the adverse effect of the named pollutant?

	pollutant	source	adverse effect
A	CO	complete combustion in a car engine	acid rain
B	CH ₄	decomposition of vegetation	increased global warming
C	NO ₂	decomposition of vegetation	photochemical smog
D	SO ₂	combustion of fuels containing sulfur	increased global warming

30 The percentage composition of gases on the planet Neptune is shown.

gas	percentage composition / %
hydrogen	80
helium	18
methane	1.5
other gases	0.5

Which statement about the atmospheres on Neptune and on the Earth is correct?

- A** There is more helium on Neptune than oxygen on the Earth.
- B** There is less methane on Neptune than carbon dioxide on the Earth.
- C** There is less hydrogen on the Earth than on Neptune.
- D** There is more helium on the Earth than on Neptune.

31 Ethane, ethene, ethanol and ethanoic acid are all organic compounds.

Which compounds are hydrocarbons?

- A** ethane, ethene, ethanol and ethanoic acid
- B** ethane and ethanol only
- C** ethane and ethene only
- D** ethane only

32 Gas oil and naphtha are two fractions obtained from petroleum.

What are uses of these fractions?

	gas oil	naphtha
A	jet fuel	making chemicals
B	jet fuel	making roads
C	diesel engine fuel	making chemicals
D	diesel engine fuel	making roads

33 Four different fuels are listed.

- 1 ethanol
- 2 petroleum
- 3 hydrogen
- 4 natural gas

Which fuels are fossil fuels?

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

34 Which formula represents a compound which turns aqueous bromine colourless?

- A** C_4H_{10} **B** C_4H_9OH **C** C_4H_9COOH **D** C_4H_8

35 Which statements about ethanol are correct?

- 1 Ethanol is made by reacting steam with ethene at 300°C .
- 2 Ethanol is made by fermentation at 55°C .
- 3 Ethanol burns to produce carbon dioxide and water.
- 4 Ethanol contains a carbon–carbon double bond.

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

- 36 Potassium ethanoate is made by reacting ethanoic acid with potassium hydroxide.

What else is formed in the reaction?

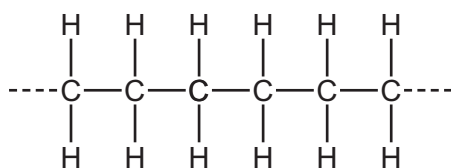
key

✓ = yes

X = no

	hydrogen	water	carbon dioxide
A	✓	X	✓
B	X	✓	✓
C	✓	X	X
D	X	✓	X

- 37 The diagram shows the structure of an important product.



This product is formed by1..... of an2..... .

Which words complete gaps 1 and 2?

	1	2
A	addition polymerisation	alkane
B	addition polymerisation	alkene
C	cracking	alkane
D	cracking	alkene

38 Which processes are required to separate sand from a mixture of solid sodium chloride and sand?

- 1 add a suitable solvent
- 2 filter
- 3 distil

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

39 Which statement about chlorine gas is correct?

- A** It bleaches damp blue litmus paper.
- B** It turns damp red litmus paper blue.
- C** It decolourises acidified aqueous potassium manganate(VII).
- D** It turns limewater cloudy.

40 A solution of compound Z gives a light blue precipitate with aqueous ammonia. The precipitate dissolves in an excess of ammonia.

A flame test is done on compound Z.

What is the colour of the flame?

- A** blue-green
- B** lilac
- C** red
- D** yellow

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