

Cambridge IGCSE™

CHEMISTRY**0620/13**

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 Which statement about solids, liquids or gases is correct?
- A Liquids are easy to compress.
 - B Solids are easy to compress.
 - C Gases expand to fill their container.
 - D Liquids expand to fill their container.
- 2 Which statement describes a compound?
- A It contains two or more elements chemically combined.
 - B It contains two or more elements physically combined.
 - C It contains two or more elements forming an alloy.
 - D It contains two or more elements that can easily be separated.
- 3 Four statements about particles in an atom are listed.
- 1 Protons and neutrons have the same relative mass and different relative charges.
 - 2 Protons and neutrons have different relative masses and the same relative charge.
 - 3 Protons and electrons have the same relative mass and different relative charges.
 - 4 Protons and electrons have different relative masses and different relative charges.

Which statements are correct?

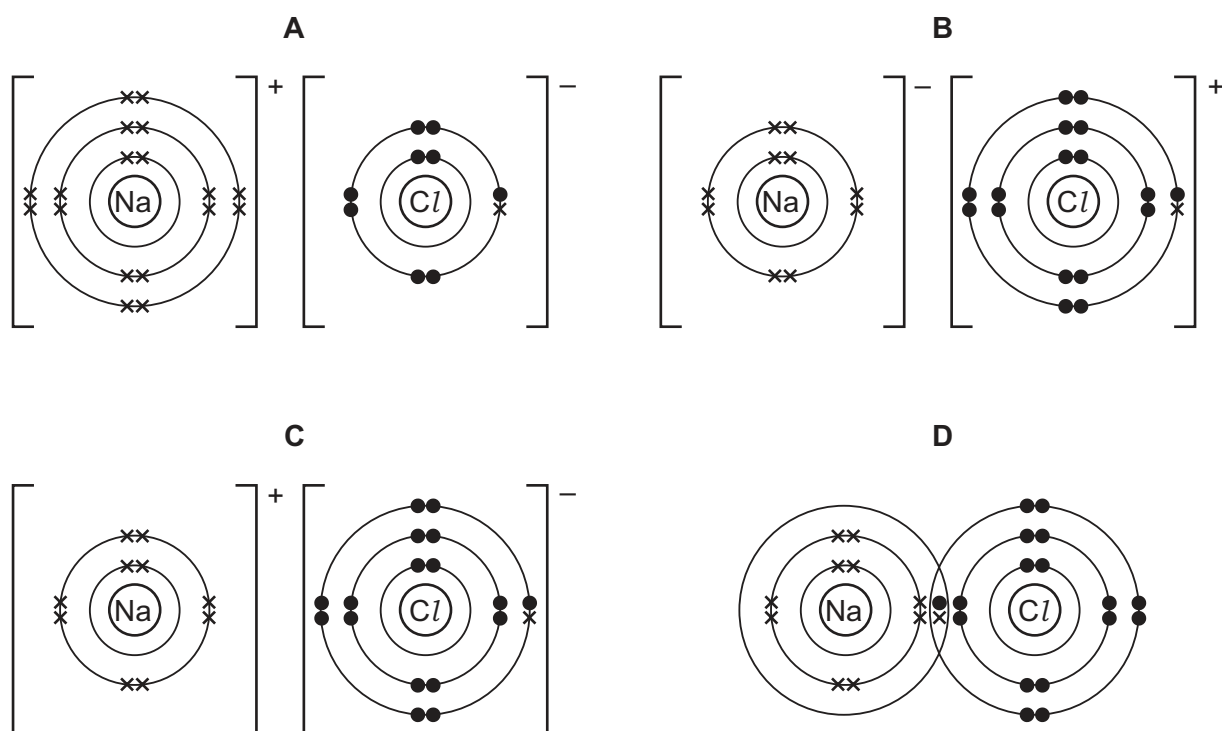
- A 1 and 3 B 1 and 4 C 2 and 3 D 2 and 4
- 4 Which statement about the atomic structure of the named element is correct?
- A Antimony, Sb, has only four occupied electron shells.
 - B Selenium, Se, has only six electrons in its third electron shell.
 - C Strontium, Sr, has four outer-shell electrons.
 - D Xenon, Xe, has five fully occupied electron shells.

- 5 An atom of element X has 20 protons and 20 neutrons.

An atom of element Y has 19 electrons and a nucleon number of 40.

Which statement is correct?

- A X is an isotope of argon.
 B X is an isotope of neon.
 C Y is an isotope of potassium.
 D Y is an isotope of zirconium.
- 6 Which dot-and-cross diagram represents the bonding in sodium chloride?



- 7 The formula of ammonia is NH_3 .

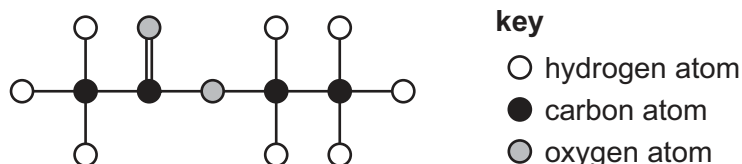
Which statement about a molecule of ammonia is correct?

- A The bonding in a molecule of ammonia is ionic.
 B The nitrogen atom has a noble gas configuration; the hydrogen atoms do **not**.
 C The nitrogen atom shares all of its electrons with the hydrogen atoms.
 D There are six shared electrons in a molecule of ammonia.

8 Which statement about graphite is correct?

- A It has a low melting point because it has a simple molecular structure.
- B It has a high melting point because it has a giant ionic structure.
- C It has a low melting point because it has weak forces of attraction between layers of atoms.
- D It has a high melting point because it has a giant covalent structure.

9 The diagram shows a model of an organic molecule.



What is the molecular formula of this organic molecule?

- A $C_2H_8O_4$
- B C_2H_4O
- C $C_4H_6O_2$
- D $C_4H_8O_2$

10 What is the relative formula mass of ammonium nitrate, NH_4NO_3 ?

- A 80
- B 108
- C 122
- D 150

11 Substance X is electrolysed.

A different gas is produced at each electrode. The gases are collected and tested at room temperature.

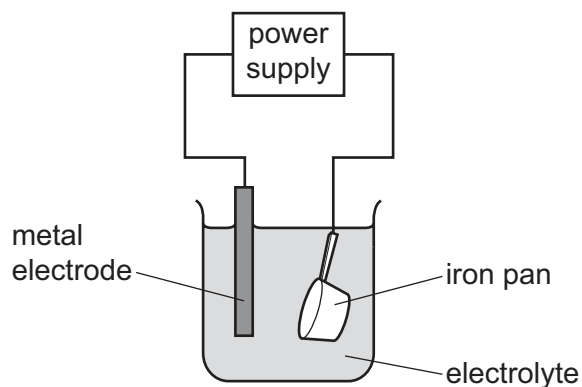
One of the gases produces a squeaky pop when tested with a lighted splint. The other gas bleaches damp litmus paper.

What is substance X?

- A concentrated aqueous sodium chloride
- B dilute sulfuric acid
- C molten lead(II) bromide
- D molten potassium chloride

12 An iron pan is electroplated with copper.

The apparatus for the electroplating is shown.



Which row identifies the metal electrode and the electrolyte?

	metal electrode	electrolyte
A	copper anode	aqueous iron(II) nitrate
B	copper anode	aqueous copper(II) nitrate
C	copper cathode	aqueous iron(II) nitrate
D	copper cathode	aqueous copper(II) nitrate

13 Four statements about hydrogen fuel cells are listed.

- 1 Carbon dioxide and water are produced in the fuel cell.
- 2 In the fuel cell, hydrogen combines with oxygen.
- 3 The fuel cell converts chemical energy into electrical energy.
- 4 The hydrogen fuel is extracted from the air.

Which statements are correct?

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

14 Four changes are described.

- 1 When sodium is added to water, thermal energy is released.
- 2 When water boils, thermal energy is absorbed.
- 3 When concentrated sulfuric acid is added to water, the temperature of the surroundings increases.
- 4 When ammonium nitrate is added to water, the temperature of the surroundings decreases.

Which changes are endothermic?

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

15 Which process involves a chemical change?

- A** adding sodium to water
B boiling water
C dissolving sodium chloride in water
D producing water from aqueous sodium chloride

16 Which word equation is correct?

- A** calcium + water → calcium hydroxide + hydrogen
B zinc + hydrochloric acid → zinc chloride + water
C magnesium + oxygen → magnesium oxide + water
D aluminium + sulfuric acid → aluminium nitrate + hydrogen

17 Dilute hydrochloric acid reacts with calcium carbonate.

1.0 g of calcium carbonate is added to 50 cm³ of dilute hydrochloric acid and the initial rate of reaction is calculated.

The experiment is repeated but **one** change is made.

All other conditions are the same.

Which row is correct?

	change made in second experiment	initial rate of second experiment compared to first experiment
A	100 cm ³ of dilute acid is used	increases
B	100 cm ³ of dilute acid is used	no change
C	2.0 g of calcium carbonate is used	decreases
D	2.0 g of calcium carbonate is used	no change

18 Substance X is a blue solid.

When X is heated, steam is produced and the solid turns white.

What is X?

- A** anhydrous cobalt(II) chloride
- B** anhydrous copper(II) sulfate
- C** hydrated cobalt(II) chloride
- D** hydrated copper(II) sulfate

19 The equations show two chemical reactions involved in the production of iron from its ore.



Which substance is reduced in reaction 1 and in reaction 2?

	reaction 1	reaction 2
A	CO ₂	CO
B	CO ₂	Fe ₂ O ₃
C	C	CO
D	C	Fe ₂ O ₃

20 Which solids neutralise dilute sulfuric acid to form aqueous magnesium sulfate?

- 1 magnesium carbonate
- 2 magnesium hydroxide
- 3 magnesium nitrate
- 4 magnesium oxide

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

21 Which statement about bases is correct?

- A** All bases dissolve in water to form solutions with a pH greater than 7.
- B** Bases react with ammonium salts to form ammonia gas.
- C** All oxides of elements in Period 3 of the Periodic Table are bases.
- D** Bases react with acids to form a salt and hydrogen.

22 A method used to make copper(II) sulfate crystals is shown.

- 1 Place dilute sulfuric acid in a beaker.
- 2 Warm the acid.
- 3 Add copper(II) oxide until it is in excess.
- 4 Filter the mixture.
- 5 Evaporate the filtrate until crystals start to form.
- 6 Leave the filtrate to cool.

What are the purposes of step 3 and step 4?

	step 3	step 4
A	to ensure all of the acid has reacted	to obtain solid copper(II) sulfate
B	to ensure all of the acid has reacted	to remove the excess of copper(II) oxide
C	to speed up the reaction	to obtain solid copper(II) sulfate
D	to speed up the reaction	to remove the excess of copper(II) oxide

23 Which row describes the changes across a period of the Periodic Table, from left to right?

	number of outer-shell electrons	metallic character
A	decreases	decreases
B	decreases	increases
C	increases	increases
D	increases	decreases

24 Which statements about elements in Group VIII of the Periodic Table are correct?

- 1 Atoms of the elements have full outer electron shells.
- 2 They are diatomic.
- 3 They are gaseous at room temperature and pressure.
- 4 They react with water.

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

25 Caesium is a Group I element.

Which statement describes a property of caesium?

- A It does **not** conduct electricity.
- B It has a higher melting point than sodium.
- C It reacts more vigorously with water than potassium.
- D It is less dense than lithium.

26 Aqueous bromine is added to aqueous sodium iodide.

bromine + sodium iodide $\rightarrow$ 1..... + ...2.....

What are the products of this reaction?

	1	2
A	iodide	sodium bromide
B	iodide	sodium bromine
C	iodine	sodium bromide
D	iodine	sodium bromine

27 Some properties of element X are listed.

- 1 It forms coloured compounds.
- 2 It has a high melting point.
- 3 It has a high density.

Which properties show that X is a transition element?

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

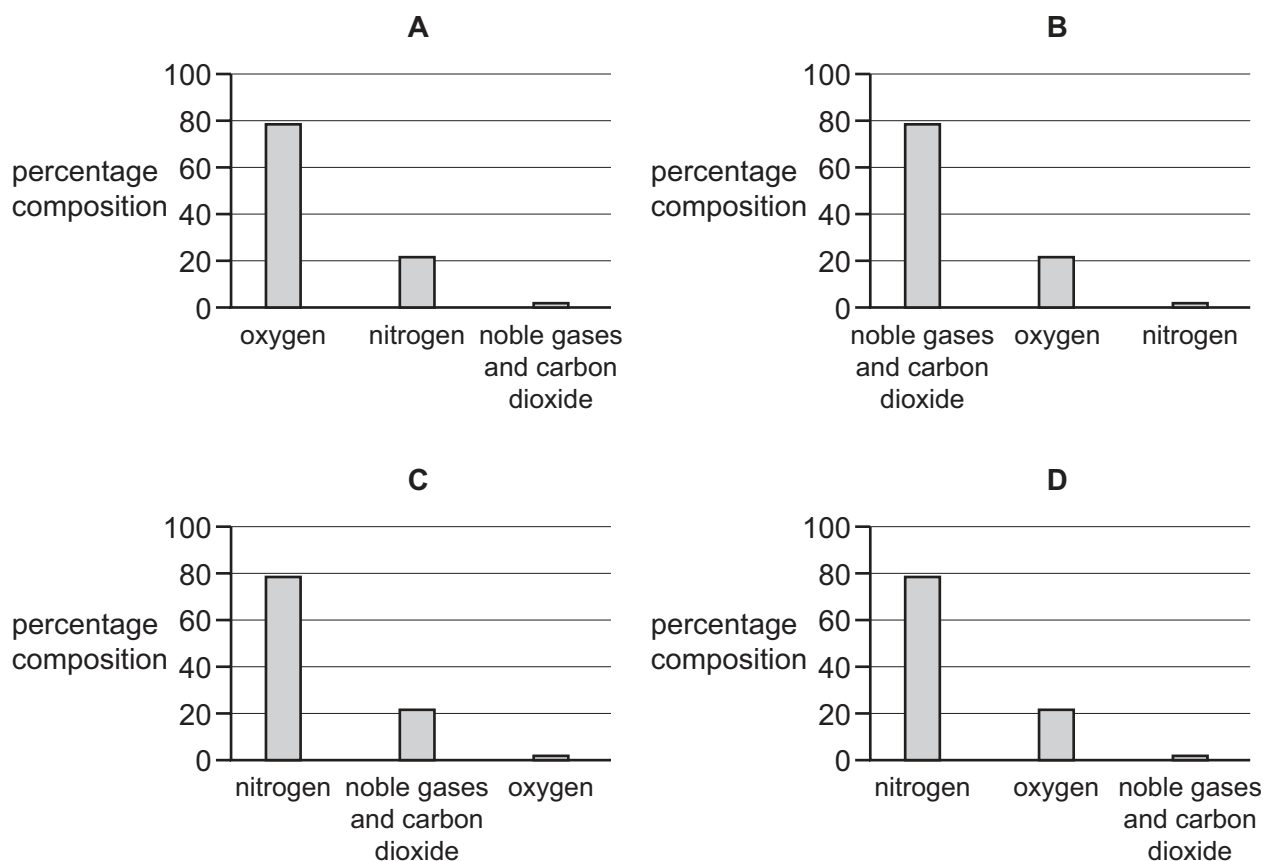
28 Cobalt is a metal. It is more reactive than hydrogen, but less reactive than iron.

Which statements are correct?

- 1 Cobalt reacts with dilute hydrochloric acid.
 - 2 Cobalt reacts rapidly with cold water to form hydrogen gas.
 - 3 Cobalt is more reactive than zinc.
 - 4 Cobalt is more reactive than copper.
- A 1 and 2 B 1 and 4 C 2 and 3 D 3 and 4

- 29 Which substances in the air are needed for iron to rust?
- A oxygen and water
 - B oxygen only
 - C water and carbon dioxide
 - D water only
- 30 In a titration, why is distilled water and **not** tap water used to rinse the burette?
- A Distilled water contains more bacteria than tap water.
 - B Distilled water contains fewer dissolved ions than tap water.
 - C Distilled water dissolves substances better than tap water.
 - D Distilled water has been filtered and tap water has **not**.
- 31 'Fastgrow' is an NPK fertiliser containing elements essential for improved plant growth.
- Which mixture of substances is used to make 'Fastgrow'?
- A ammonium sulfate and potassium nitrate
 - B ammonium nitrate and potassium phosphate
 - C sodium nitrate and ammonium phosphate
 - D sodium phosphate and potassium chloride

32 Which diagram shows the percentage composition of clean, dry air?



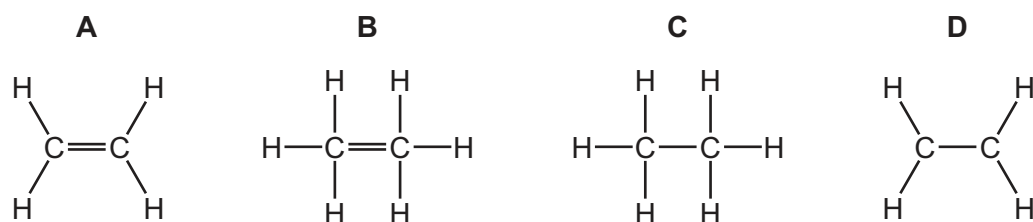
33 What is the general formula of the alcohol homologous series?

- A** C_nH_nOH **B** $C_nH_{2n-1}OH$ **C** $C_nH_{2n}OH$ **D** $C_nH_{2n+1}OH$

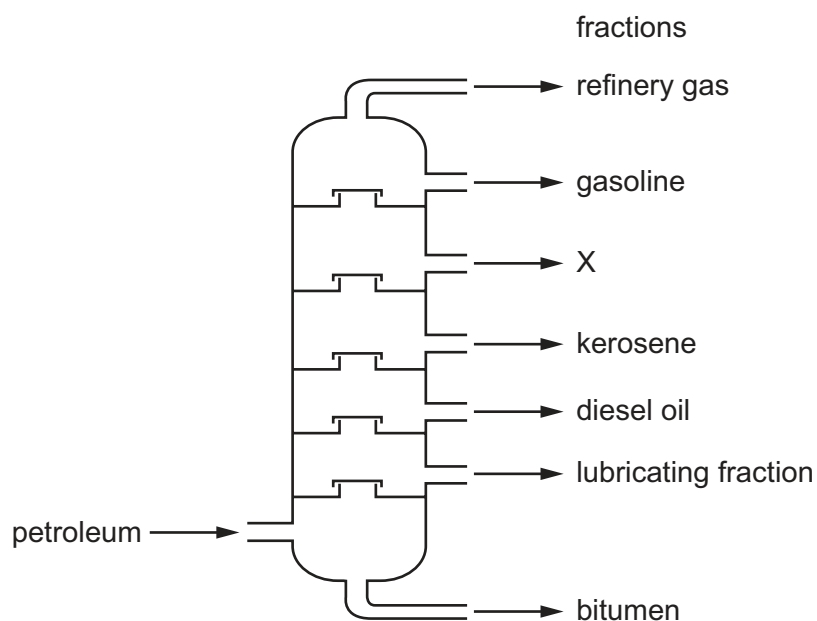
34 Which statement describes ethane?

- A** It is a saturated covalent compound.
B It is an unsaturated covalent compound.
C It is a saturated ionic compound.
D It is an unsaturated ionic compound.

35 Which structure represents ethene?



36 What is the name of fraction X?



- A alcohol
- B fuel oil
- C naphtha
- D paraffin

37 Four equations involving ethanoic acid are listed.

- 1 ethanoic acid + calcium $\rightarrow$ calcium ethanoate + water
- 2 ethanoic acid + magnesium oxide $\rightarrow$ magnesium ethanoate + water
- 3 $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$
- 4 $2\text{CH}_3\text{COOH} + \text{Na}_2\text{CO}_3 \rightarrow 2\text{CH}_3\text{COONa} + \text{H}_2\text{O}$

Which equations are correct?

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

38 Which piece of apparatus is used to measure exactly 25.00 cm^3 of dilute hydrochloric acid?

- A a balance
- B a beaker
- C a measuring cylinder
- D a volumetric pipette

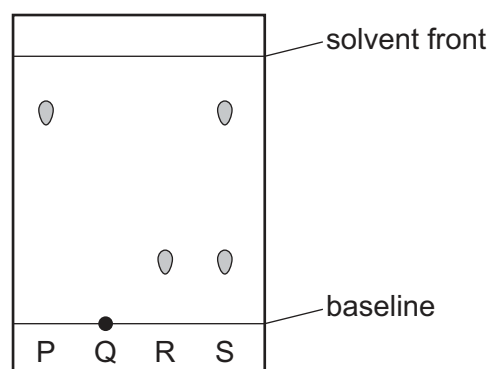
- 39 A mixture contains sand and an aqueous solution of sodium chloride.

Which processes are used to obtain a sample of solid sand **and** a sample of solid sodium chloride from the mixture?

- A crystallisation followed by filtration
- B evaporation followed by filtration
- C filtration followed by crystallisation
- D simple distillation followed by crystallisation

- 40 Four coloured substances, P, Q, R and S, are analysed by chromatography.

The chromatogram is shown.



Which statements are correct?

- 1 P is less soluble in the solvent than R.
 - 2 R is a pure substance.
 - 3 Q is insoluble in the solvent used.
 - 4 S is a mixture of P and R.
- A** 1, 2 and 3 **B** 1, 2 and 4 **C** 2, 3 and 4 **D** 3 and 4 only

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The Periodic Table of Elements

Group																		
I	II											III	IV	V	VI	VII	VIII	
												1 H hydrogen 1						
												</						