

Cambridge IGCSE™

CHEMISTRY

Paper 1 Multiple Choice (Core)

0620/12**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.

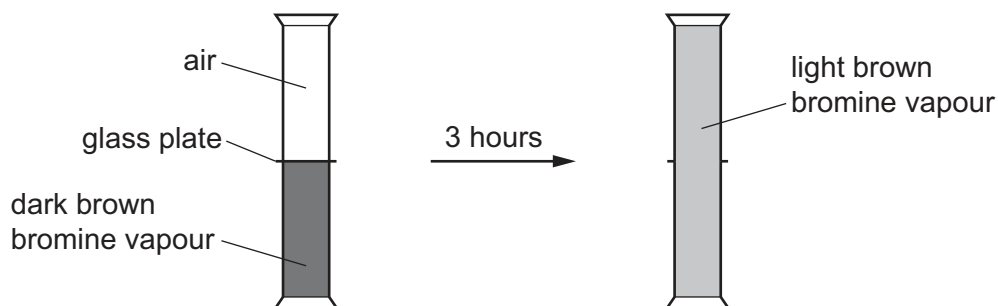
INFORMATION

- 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?

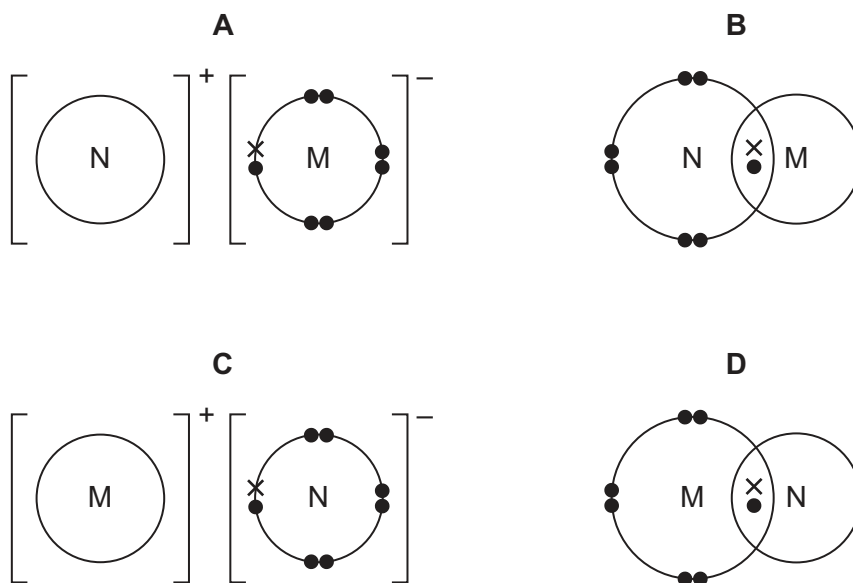
	relative charge	relative mass
A	-1	$\frac{1}{1840}$
B	0	1
C	+1	$\frac{1}{1840}$
D	-1	1

- 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?



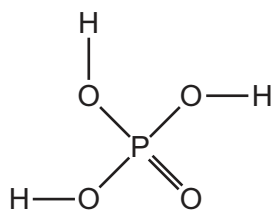
- 5 What is the total number of shared electrons in one molecule of ammonia?

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

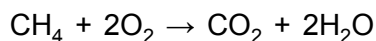
- 7 The diagram represents phosphoric acid.



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

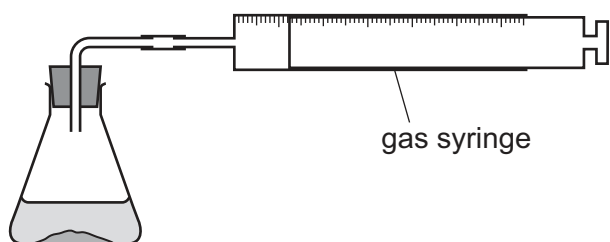
- 11** X is an insoluble binary compound.

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.

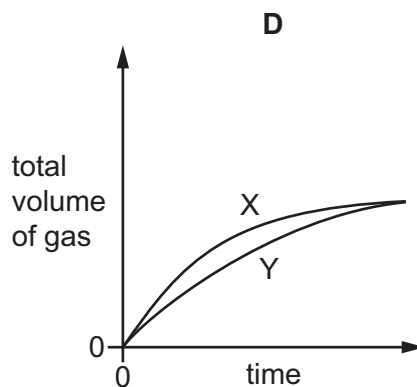
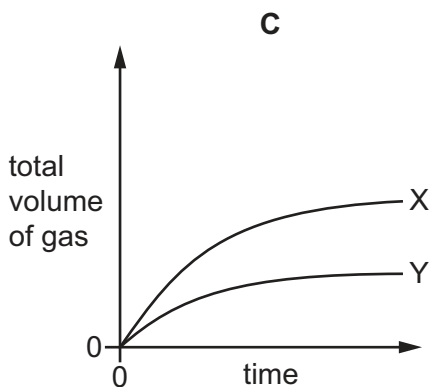
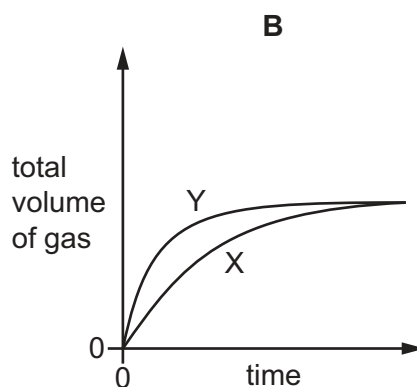
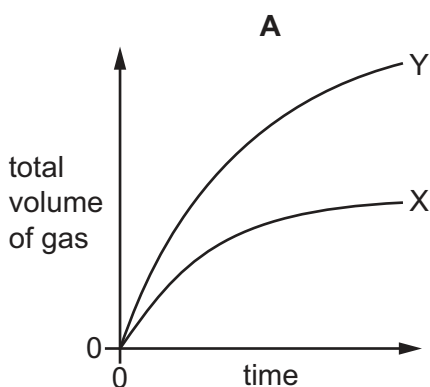
- 14 An experiment X is carried out between a solid and a solution using the apparatus shown.



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	✓

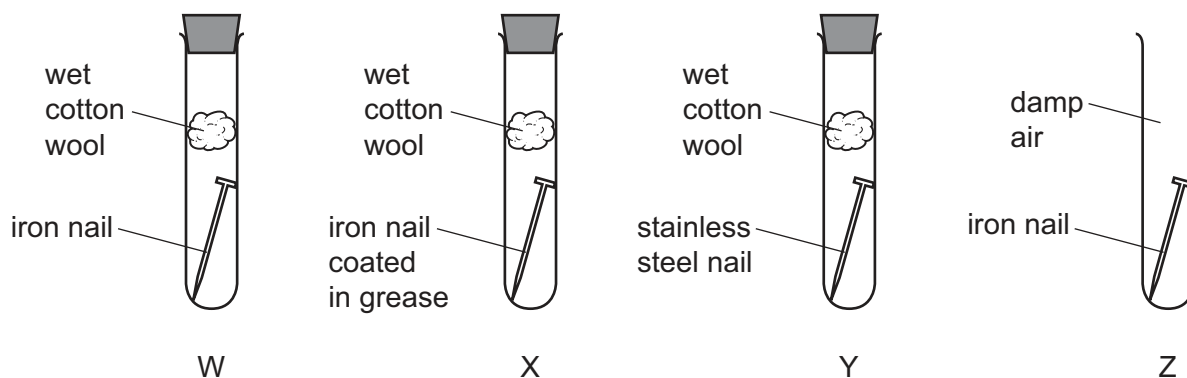
24 Which alkali and acid react to produce a salt in which both the cation and anion are used to make a fertiliser?

- 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?

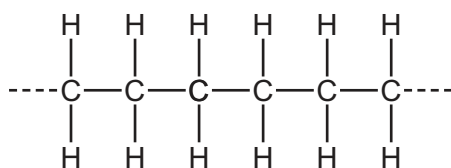
key

✓ = 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 by 1..... of an 2..... .

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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The Periodic Table of Elements

Group																		
I	II	Key										III	IV	V	VI	VII	VIII	
		1Hhydrogen1																
3Li lithium 7	4Be beryllium 9	atomic number atomic symbol name relative atomic mass										5B boron 11	6C carbon 12	7N nitrogen 14	8O oxygen 16	9F fluorine 19	2He helium 4	
11Na sodium 23	12Mg magnesium 24											13Al aluminium 27	14Si silicon 28	15P phosphorus 31	16S sulfur 32	17Cl chlorine 35.5	18Ar argon 40	
19K potassium 39	20Ca calcium 40	21Sc scandium 45	22Ti titanium 48	23V vanadium 51	24Cr chromium 52	25Mn manganese 55	26Fe iron 56	27Co cobalt 59	28Ni nickel 59	29Cu copper 64	30Zn zinc 65	31Ga gallium 70	32Ge germanium 73	33As arsenic 75	34Se selenium 79	35Br bromine 80	36Kr krypton 84	
37Rb rubidium 85	38Sr strontium 88	39Y yttrium 89	40Zr zirconium 91	41Nb niobium 93	42Mo molybdenum 96	43Tc technetium —	44Ru ruthenium 101	45Rh rhodium 103	46Pd palladium 106	47Ag silver 108	48Cd cadmium 112	49In indium 115	50Sn tin 119	51Sb antimony 122	52Te tellurium 128	53I iodine 127	54Xe xenon 131	
55Cs caesium 133	56Ba barium 137	57–71 lanthanoids		72Hf hafnium 178	73Ta tantalum 181	74W tungsten 184	75Re rhenium 186	76Os osmium 190	77Ir iridium 192	78Pt platinum 195	79Au gold 197	80Hg mercury 201	81Tl thallium 204	82Pb lead 207	83Bi bismuth 209	84Po polonium —	85At astatine —	86Rn radon —
87Fr francium —	88Ra radium —	89–103 actinoids		104Rf rutherfordium —	105Db dubnium —	106Sg seaborgium —	107Bh bohrium —	108Hs hassium —	109Mt meitnerium —	110Ds darmstadtium —	111Rg roentgenium —	112Cn copernicium —	113Nh nihonium —	114Fl flerovium —	115Mc moscovium —	116Lv livermorium —	117Ts tennessine —	118Og oganesson —

lanthanoids

57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium —	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
89 Ac actinium —	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium —	94 Pu plutonium —	95 Am americium —	96 Cm curium —	97 Bk berkelium —	98 Cf californium —	99 Es einsteinium —	100 Fm fermium —	101 Md mendelevium —	102 No nobelium —	103 Lr lawrencium —

actinoids

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).