CAMBRIDGE
International Education

Cambridge O Level

CHEMISTRY **5070/12**

Paper 1 Multiple Choice **May/June 2026**

1 hour

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)

0324456598

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.

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1 The melting and boiling points of four substances are shown.

	melting point / °C	**boiling point / °C**
ammonia, NH_3	–78	–33
hydrogen sulfide, H_2S	–85	–61
propane, C_3H_8	–190	–42
xenon, Xe	–112	–107

Which substance has the greatest rate of diffusion at –50 °C?

A ammonia

B hydrogen sulfide

C propane

D xenon

2 Which statement is correct?

A Air is a mixture because it is made up entirely of different compounds.

B Chlorine is an element because all of its atoms have the same atomic number and mass number.

C Lead(II) bromide is a compound because it is impossible to separate it into its elements.

D Stainless steel is a mixture because it can have a variable composition of different elements.

3 Which number is different for two isotopes of the same element?

A the number of outer-shell electrons in each atom

B the total number of electrons in each atom

C the number of neutrons in each atom

D the number of protons in each atom

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4 Magnesium oxide has a high melting point. It is used to line the inside of furnaces that operate at high temperatures.

Why does magnesium oxide have a high melting point?

A It has metallic bonds.

B It has strong forces between its molecules.

C It is a simple molecular substance.

D It is an ionic compound.

5 Which substance has a giant covalent structure and contains atoms of more than one element?

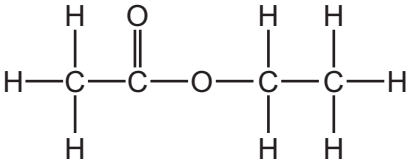
A diamond

B graphite

C methane

D silicon(IV) oxide

6 The displayed formula of a compound is shown.



What is the empirical formula of the compound?

A CHO

B C_2H_4O

C $C_4H_8O_2$

D $CH_3COOCH_2CH_3$

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7 An ionic compound contains only three elements, X, Y and Z.

The compound has a ratio of one atom of X to one atom of Y to three atoms of Z.

The average mass of the isotopes of element X is twice the mass of an atom of $^{12}_{6}C$.

The average mass of the isotopes of element Y is equal to the mass of an atom of $^{12}_{6}C$.

The relative atomic mass of Z is $\frac{4}{3}$ times the relative atomic mass of Y.

What is the relative formula mass of the compound?

A 26 **B** 42 **C** 52 **D** 84

8 Nitrogen monoxide and oxygen react to form nitrogen dioxide.

$$2NO(g) + O_2(g) \rightarrow 2NO_2(g)$$

What is the maximum volume of nitrogen dioxide that may be obtained when 1 dm^3 of nitrogen monoxide reacts with 2 dm^3 of oxygen when all volumes are measured at room temperature and pressure?

A 1 dm^3 **B** 2 dm^3 **C** 3 dm^3 **D** 4 dm^3

9 During a titration, 25.0 cm^3 of 0.050 mol / dm^3 aqueous sodium hydroxide, NaOH, reacts exactly with 20.0 cm^3 of dilute phosphoric acid, H_3PO_4.

$$3NaOH + H_3PO_4 \rightarrow Na_3PO_4 + 3H_2O$$

What is the concentration of the dilute phosphoric acid?

A 0.0208 mol / dm^3

B 0.0313 mol / dm^3

C 0.0625 mol / dm^3

D 0.1875 mol / dm^3

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10 Concentrated and dilute aqueous XC*l* are electrolysed separately using inert electrodes.

X is a more reactive metal than sodium.

Which row shows the products at the cathode and the anode?

	concentrated aqueous XC*l*		**dilute aqueous XC*l***	
	product at the cathode	**product at the anode**	**product at the cathode**	**product at the anode**
A	hydrogen	chlorine	X	oxygen
B	hydrogen	oxygen	X	chlorine
C	hydrogen	chlorine	hydrogen	oxygen
D	X	oxygen	hydrogen	chlorine

11 Which statement comparing hydrogen–oxygen fuel cells with gasoline / petrol engines is correct?

A A disadvantage of a hydrogen–oxygen fuel cell is that hydrogen is more difficult to store than gasoline / petrol.

B A disadvantage of a hydrogen–oxygen fuel cell is that it is less efficient than a gasoline / petrol engine.

C An advantage of a hydrogen–oxygen fuel cell is that it only produces carbon dioxide and water as products.

D An advantage of gasoline / petrol engines is that they produce carbon monoxide by incomplete combustion.

12 Which row about endothermic reactions is correct?

	overall energy change	**ΔH**
A	energy released when bonds are made is greater than energy used to break bonds	negative
B	energy released when bonds are made is less than energy used to break bonds	negative
C	energy released when bonds are made is greater than energy used to break bonds	positive
D	energy released when bonds are made is less than energy used to break bonds	positive

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13 Which property of a substance always remains the same during a physical change?

A the density of the substance

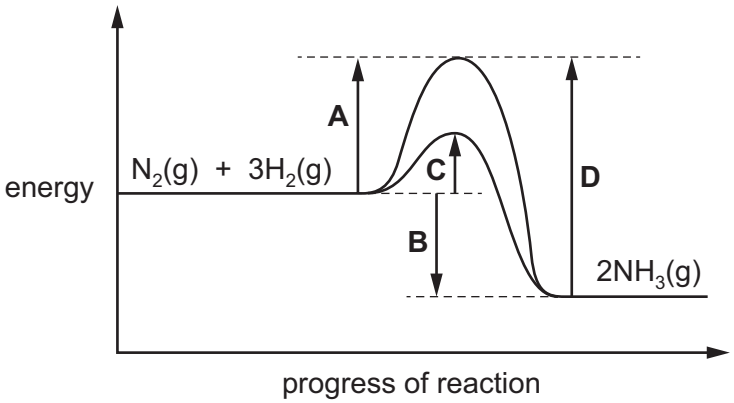
B the mass of the substance

C the distance between the particles in the substance

D the arrangement of particles in the substance

14 The reaction pathway diagram for both the catalysed and uncatalysed reactions between N_2 and H_2 in the Haber process is shown.

What is the activation energy for the formation of NH_3 in the presence of a catalyst?



15 Elements X and Y react together in a reversible reaction to form XY_2.

$$X + 2Y \rightleftharpoons XY_2$$

1.0 mol of X is mixed with 1.0 mol of Y and the mixture is left to react until an equilibrium position is reached.

Which statements about this reaction are correct?

1 After the equilibrium position has been reached, the reaction stops.

2 At equilibrium, there is more than 0.5 mol of X present.

3 At equilibrium, there is less than 1.0 mol of XY_2 present.

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

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16 Iodine, I_2, reacts with thiosulfate ions, $S_2O_3^{2-}$.

$$I_2(aq) + 2S_2O_3^{2-}(aq) \rightarrow 2I^-(aq) + S_4O_6^{2-}(aq)$$

Which row is correct?

	colour of I_2(aq)	**I_2(aq) is**
A	brown	a reducing agent
B	brown	an oxidising agent
C	colourless	a reducing agent
D	colourless	an oxidising agent

17 Citric acid is a soluble carboxylic acid.

A student does two tests on separate samples of an aqueous solution of citric acid.

Which row is correct?

	effect when limestone is added	**effect when thymolphthalein is added**
A	carbon dioxide formed	colourless solution
B	hydrogen formed	blue solution
C	carbon dioxide formed	blue solution
D	hydrogen formed	colourless solution

18 Two solutions are prepared.

- Solution P is 0.050 mol / dm^3 hydrochloric acid.
- Solution Q is 0.100 mol / dm^3 butanoic acid.

A 2 cm strip of magnesium ribbon is put into 100 cm^3 of each solution. Fizzing is seen in both solutions, but the fizzing is faster in solution P than it is in solution Q.

Which statement helps to explain this observation?

A Magnesium reacts with solution P to form a salt, but does **not** form a salt with solution Q.

B More particles are dissociated in solution P than are dissociated in solution Q.

C Solution Q contains a stronger acid than solution P.

D The particles are closer together in solution Q than they are in solution P.

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19 The formulae of three oxides are listed.

1 CuO

2 SO_2

3 ZnO

Which oxides react with NaOH(aq) to form a salt?

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

20 Which statement about the arrangement of the elements in the Periodic Table is correct?

A In all groups, the reactivity of the elements increases down the group.

B The metallic character of the elements increases from left to right across a period.

C The charge in the nucleus changes by the same amount from one element to the next down a group.

D The charge in the nucleus changes by the same amount from one element to the next across a period.

21 Four statements about the elements in Group I of the Periodic Table are listed.

1 Potassium has a higher density than lithium.

2 Sodium has a higher melting point than lithium.

3 Lithium has more occupied electron shells than sodium.

4 Potassium is more reactive than sodium with water.

Which statements are correct?

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

22 Rubidium is in Group I and fluorine is in Group VII of the Periodic Table.

Which statements about these elements are correct?

1 Chlorine will displace fluorine from a solution of its salts.

2 Bromine is a liquid at r.t.p.

3 Rubidium is a soft metal.

4 Rubidium reacts more vigorously than potassium with water.

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

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23 Which statement about transition elements is correct?

A Their soluble salts usually form coloured aqueous solutions.

B They are all in the same group of the Periodic Table.

C They are non-metals with high melting points.

D They can be mixed together to form compounds.

24 Which row describes an element in Group VIII of the Periodic Table?

	reactivity	**structure**
A	reactive	diatomic
B	reactive	monatomic
C	unreactive	diatomic
D	unreactive	monatomic

25 The properties of four substances are shown.

The letters in the table are **not** the formulae of the substances.

Which substances in the table may be metals?

substance	**melting point / °C**	**electrical conductivity**		
		when solid	**when molten**	**in aqueous solution**
W	1772	good	good	insoluble
X	1261	poor	good	good
Y	1535	good	good	insoluble
Z	113	poor	poor	insoluble

A W and X **B** W and Y **C** X and Z **D** Y and Z

26 Which statement about metals and alloys is correct?

A Brass is a mixture of copper and tin.

B Cutlery made of stainless steel contains iron and does **not** rust easily.

C In pure metals, the negative ions are all the same size.

D The hardness of iron is decreased by forming an alloy with chromium, nickel and carbon.

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27 When element X is added to aqueous copper(II) sulfate, no effervescence is observed.

The blue solution turns colourless.

What is element X?

A calcium

B potassium

C silver

D zinc

28 Which substance is used for the electrodes when aluminium is extracted from its ore?

A bauxite

B carbon

C cryolite

D platinum

29 Water is added to anhydrous cobalt(II) chloride.

Which colour change is seen?

A blue to pink

B blue to white

C pink to blue

D white to blue

30 Z is a pollutant gas that is formed in car engines.

An aqueous solution of Z is acidic.

Z is removed from the exhaust gases in a catalytic converter by reduction.

What is Z?

A CO **B** N_2 **C** H_2O **D** NO_2

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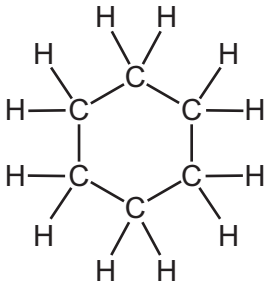
31 The structures of three compounds are shown.



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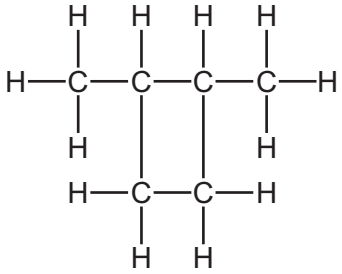

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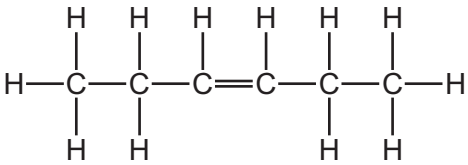

3

Which compounds are structural isomers of each other?

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

32 X and Y are hydrocarbons obtained from the fractional distillation of petroleum.

Their molecular formulae are shown.

X: $C_{18}H_{38}$

Y: C_8H_{18}

Three statements are listed.

1 X and Y are both alkanes.

2 X has a higher viscosity than Y.

3 X comes from a fraction obtained higher in the fractionating column than Y.

Which statements are correct?

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

33 An unbranched alkene, C_4H_8, undergoes an addition reaction with bromine.

What is the possible structure of the product?

A $CH_3CHBrCH_2CH_2Br$

B $CH_3CHBrCHBrCH_3$

C $CH_2BrCH_2CH_2CH_2Br$

D $CH_3CH_2CH_2CH_2Br$

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34 X mol of ethanol and X mol of propan-1-ol separately undergo complete combustion at the same temperature and pressure.

The complete combustion of X mol of propan-1-ol requires 0.15 mol of oxygen more than the complete combustion of X mol of ethanol.

What is the value of X?

A 0.10 **B** 0.15 **C** 1.00 **D** 1.50

35 Ethanol can be converted by bacteria into vinegar, which contains ethanoic acid.

Which type of chemical reaction is caused by the bacteria?

A hydrogenation

B neutralisation

C oxidation

D reduction

36 An ester has the formula $C_2H_5COOC_2H_5$.

Which pair of compounds would react together to form this ester?

A ethanoic acid and ethanol

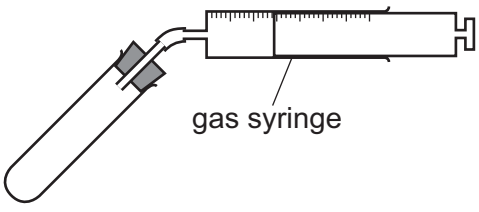
B ethanol and propanoic acid

C propanoic acid and propanol

D propanol and ethanoic acid

37 The formula of magnesium oxide can be investigated by using the fact that when magnesium is heated, it reacts with oxygen to form magnesium oxide.

Which apparatus is used for this investigation?



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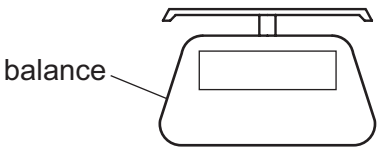

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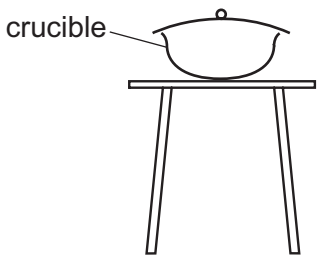

3

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

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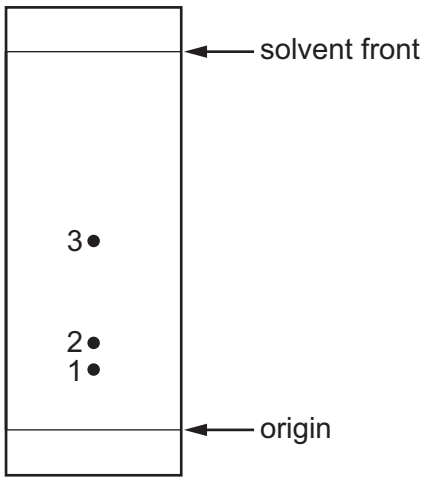
38 The diagram represents a chromatogram of the colourless acids in a drink. The chromatogram has been treated with a locating agent.

A table of R_f values for the possible acids is given.



acid	R_f value
tartaric	0.14
citric	0.16
malic	0.23
lactic	0.45
succinic	0.50

Which acids are in the drink?

A citric acid, malic acid and lactic acid

B citric acid, malic acid and succinic acid

C malic acid, lactic acid and succinic acid

D tartaric acid, citric acid and malic acid

39 Which two pieces of apparatus are essential when separating a mixture of sodium chloride and barium sulfate?

1 filter funnel

2 filter paper

3 measuring cylinder

4 thermometer

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

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40 An unknown salt, X, contains only one cation and only one anion.

Aqueous sodium hydroxide is added to an aqueous solution of X.

A white precipitate is formed that is soluble in excess aqueous sodium hydroxide.

Aluminium foil is then added to the mixture and the mixture is warmed. A gas is produced that turns damp red litmus paper blue.

Which ions are in salt X?

A NH_4^+ and SO_3^{2-}

B Al^{3+} and NO_3^-

C Ca^{2+} and NO_3^-

D Zn^{2+} and SO_3^{2-}

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –	113 Nh nihonium –	114 Fl flerovium –	115 Mc moscovium –	116 Lv livermorium –	117 Ts tennessine –	118 Og oganesson –

Key

atomic number
atomic symbol
name
relative atomic mass

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
actinoids	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 –

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).