Cambridge Assessment International Education

Cambridge IGCSE™

CHEMISTRY **0620/11**

Paper 1 Multiple Choice (Core) **October/November 2025**

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.

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[Turn over

1 Which process describes the movement of a substance **very slowly** from an area of high concentration to an area of low concentration?

A a liquid being frozen

B a solid melting

C a substance diffusing through a liquid

D a substance diffusing through the air

2 The atomic number and nucleon number of a potassium atom are shown.

atomic number	19
nucleon number	39

How many protons, neutrons and electrons are in the potassium ion, K^+, which is formed from this potassium atom?

	protons	neutrons	electrons
A	19	20	18
B	19	20	20
C	20	19	18
D	20	19	19

3 Magnesium is in Group II and Period 3 of the Periodic Table.

Which row shows the charge on a magnesium ion and the electronic configuration of a magnesium ion?

	charge	electronic configuration
A	+2	2,8
B	+2	2,8,2
C	–2	2,8
D	–2	2,8,2

4 Sodium is in Group I of the Periodic Table.

Chlorine is in Group VII of the Periodic Table.

Sodium and chlorine combine to form a compound.

Which statement about the combination of sodium and chlorine atoms is correct?

A Both sodium and chlorine lose electrons.

B Both sodium and chlorine gain electrons.

C Sodium loses electrons and chlorine gains electrons.

D Sodium gains electrons and chlorine loses electrons.

5 Strontium nitrate is an ionic compound.

Cyclohexane is a covalent compound.

Which row describes a property of each compound?

	strontium nitrate	cyclohexane
A	conducts electricity in aqueous solution	low boiling point
B	low melting point	insoluble in water
C	soluble in water	conducts electricity when solid
D	conducts electricity when solid	high melting point

6 Which element forms covalent bonds with hydrogen?

A magnesium

B neon

C nitrogen

D sodium

7 Which statement about graphite and diamond is correct?

A Diamond has a high melting point but graphite does **not**.

B Graphite and diamond both conduct electricity.

C Graphite and diamond both have giant structures.

D Graphite is ionic and diamond is covalent.

[Turn over

8 Carbon dioxide gas reacts with aqueous calcium hydroxide to form calcium carbonate.

Which equation represents this reaction?

A $CO_2(g) + Ca(OH)_2(aq) \rightarrow CaCO_3(s) + H_2O(l)$

B $CO_2(g) + Ca(OH)_2(aq) \rightarrow CaCO_3(aq) + H_2O(l)$

C $2CO_2(g) + 2CaOH(aq) \rightarrow 2CaCO_3(s) + H_2(g)$

D $2CO_2(g) + 2CaOH(aq) \rightarrow 2CaCO_3(aq) + H_2(g)$

9 The equation for the combustion of magnesium is shown.

$$2Mg + O_2 \rightarrow 2MgO$$

Which mass of magnesium oxide will be formed from the complete reaction of 9.6 g of magnesium?

A 8.0 g **B** 16.0 g **C** 24.0 g **D** 40.0 g

10 Which row identifies the product at each electrode when molten zinc chloride is electrolysed using inert electrodes?

	positive electrode	negative electrode
A	O_2	Zn
B	Cl_2	Zn
C	Zn	Cl_2
D	Zn	O_2

11 Which equation represents the reaction in a hydrogen–oxygen fuel cell?

A $2H_2 + O_2 \rightarrow 2H_2O$

B $2H_2 + 2O \rightarrow 2H_2O$

C $2H_2O \rightarrow 2H_2 + O_2$

D $2H_2O \rightarrow 2H_2 + 2O$

12 What is always produced when a fuel is burned?

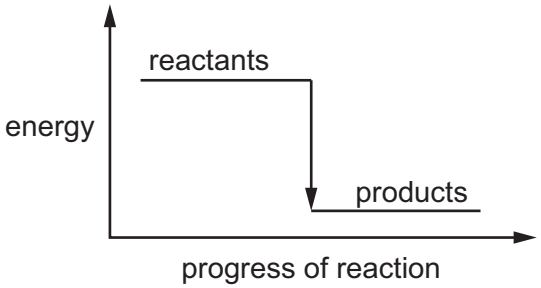
A carbon dioxide

B carbon monoxide

C oxides of nitrogen

D thermal energy

13 The reaction pathway diagram shows the energy of the reactants and products in a chemical reaction.



Which row describes the enthalpy change and the type of reaction shown?

	description of energy change	type of reaction
A	thermal energy is given out to the surroundings	endothermic
B	thermal energy is given out to the surroundings	exothermic
C	thermal energy is taken in from the surroundings	endothermic
D	thermal energy is taken in from the surroundings	exothermic

14 Magnesium is reacted with dilute hydrochloric acid of the same concentration in four experiments using different conditions.

Which reaction finished in the shortest time?

A 2 g of magnesium powder in 50 cm^3 of dilute HCl at 45 °C

B 2 g of magnesium powder in 50 cm^3 of dilute HCl at 50 °C

C 2 g of magnesium ribbon in 50 cm^3 of dilute HCl at 45 °C

D 2 g of magnesium ribbon in 50 cm^3 of dilute HCl at 50 °C

15 Blue hydrated copper(II) sulfate produces a white solid when it is heated.

The white solid turns blue when water is added.

Which word describes the reaction of hydrated copper(II) sulfate?

A neutralisation

B oxidation

C reduction

D reversible

[Turn over

16 Iron(III) chloride, $FeCl_3$, is a brown solid.

What is the meaning of (III) in the name?

A It is the amount of energy released when the compound was formed.

B It is the rate of the reaction that formed this compound.

C It is how many atoms of iron are bonded together in the compound.

D It is the oxidation number of iron in the compound.

17 What are the units of concentration?

A mol/dm^3 **B** g/dm **C** dm^3/mol **D** cm/g

18 Which pair of reactants are both soluble in water and mix to form a precipitate?

A $NaCl$ and $Mg(NO_3)_2$

B $BaSO_4$ and K_2CO_3

C $CaCl_2$ and $NaNO_3$

D $Pb(NO_3)_2$ and KCl

19 Four oxides are listed.

1 lithium oxide

2 phosphorus oxide

3 sodium oxide

4 sulfur dioxide

Which oxides are basic?

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

20 Cobalt is a typical transition element.

Which statement about cobalt is correct?

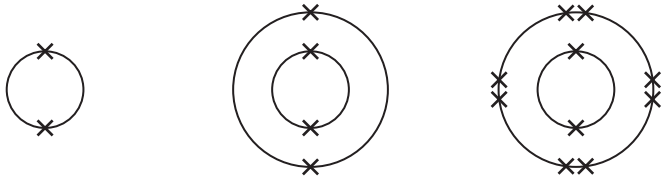
A Cobalt has a low density.

B Cobalt has a low melting point.

C Cobalt can form only colourless compounds.

D Cobalt can act as a catalyst.

21 Which diagrams show the electronic configuration for an atom of a noble gas?



1 2 3

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

22 Which statement describes the alloy brass?

A It is a mixture of iron and nickel.

B It is a mixture of iron compounds.

C It is a compound of copper, zinc and non-metals.

D It is a mixture of the metals copper and zinc.

23 The results of the reaction of metals W, X, Y and Z with cold water and dilute acid are shown.

metal	reaction with cold water	reaction with dilute acid
W	fizzes, gas evolved	rapid fizzing, gas evolved
X	no observable reaction	no observable reaction
Y	no observable reaction	slow fizzing, gas evolved
Z	a few bubbles of gas	fizzes, gas evolved

What is the order of reactivity of the metals?

	least reactive →			most reactive
A	W	Z	Y	X
B	W	Y	Z	X
C	X	Y	Z	W
D	X	Z	Y	W

24 Some methods of preventing iron from rusting are listed.

1 alloying with chromium

2 greasing

3 painting

Which methods are barrier methods?

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

25 Which metal is extracted from bauxite by electrolysis?

A aluminium

B copper

C iron

D zinc

26 Which statement about water is correct?

A When water is added to solid anhydrous cobalt(II) chloride, the solid turns blue.

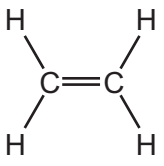
B Water containing dissolved sodium chloride boils at a temperature greater than 100 °C.

C All dissolved metal ions found in natural sources of water are beneficial to life.

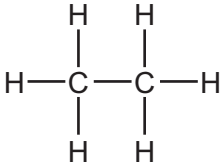
D Soluble impurities are removed during the sedimentation stage in the treatment of drinking water.

27 What is the structure of ethanol?

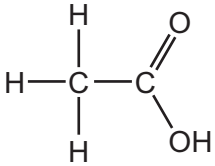
A



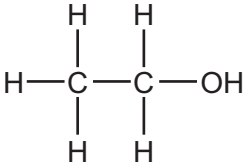
B



C



D



28 Which statement about alkanes is correct?

A They contain carbon, hydrogen and oxygen only.

B They are saturated compounds with only single ionic bonds.

C The alkanes with longer chain lengths are more volatile.

D They react with chlorine in a substitution reaction.

29 Which row identifies an adverse effect of the named pollutant?

	air pollutant	adverse effect
A	methane	global warming
B	sulfur dioxide	cancer
C	particulates	acid rain
D	carbon monoxide	photochemical smog

30 Which group of compounds have the same general formula?

A CH_4, C_2H_6, C_3H_6

B CH_4, C_3H_6, C_4H_8

C C_2H_4, C_3H_6, C_4H_8

D C_2H_4, C_3H_8, C_4H_8

31 Some fractions obtained from petroleum are listed.

	fraction	use	position collected in the fractionating column
1	gasoline	waxes and polishes	below refinery gas
2	bitumen	making roads	above kerosene
3	kerosene	jet fuel	below gasoline
4	refinery gas	heating and cooking	above gasoline

Which rows are correct?

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

32 Four different substances or types of substance are listed.

1 hydrogen

2 alcohols

3 alkenes

4 carboxylic acids

Which substances are produced by cracking larger alkane molecules?

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

33 Which row shows the conditions used to manufacture ethanol from ethene and steam?

	temperature / °C	pressure / kPa
A	35	60
B	35	6000
C	300	60
D	300	6000

34 Which statement about aqueous ethanoic acid is correct?

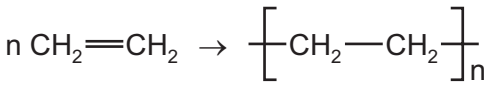
A It reacts with metal carbonates to form salts, hydrogen and water.

B It reacts with metal oxides to form salts and oxygen.

C It reacts with reactive metals to form salts and hydrogen.

D It turns damp red litmus paper blue.

35 The equation represents a polymerisation reaction.



Which statements are correct?

1 The monomer is ethane.

2 The reaction is addition polymerisation.

3 The polymer does **not** easily decompose.

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

36 A sample of wax is heated. It begins to melt at 45 °C and finishes melting at 49 °C.

A sample of liquid is heated. It begins to boil at 141 °C and remains at 141 °C while it boils.

Which conclusion can be made from these results?

A Both substances are impure.

B Both substances are pure.

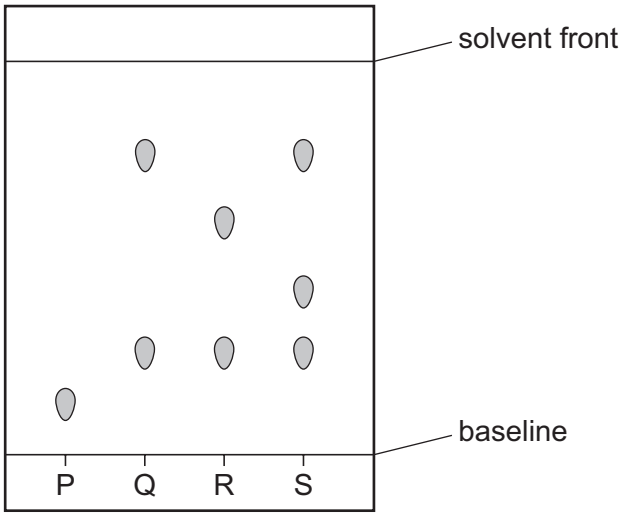
C The wax is **not** a pure substance and the liquid is a pure substance.

D The wax is a pure substance and the liquid is **not** a pure substance.

37 Four dyes, P, Q, R and S, are analysed using chromatography.

Water is the solvent.

The chromatogram produced is shown.



Which statement about the dyes is correct?

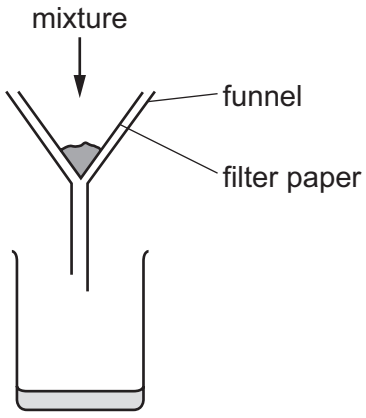
A All four dyes are impure.

B The four dyes contain a total of eight different substances.

C Dye R is a mixture of dye P and dye Q.

D Dye S is a mixture of dye Q and one other substance.

38 The apparatus used to separate a mixture is shown.



What is the mixture?

A aqueous calcium chloride and aqueous calcium nitrate

B copper(II) hydroxide and aqueous calcium chloride

C ethanol and water

D sand and calcium carbonate

[Turn over

39 Two different white solids are heated and the gases formed are tested.

The gas from solid 1 turns damp red litmus paper blue.

The gas from solid 2 relights a glowing splint.

Which row identifies the gases formed from each solid?

	solid 1	solid 2
A	ammonia	hydrogen
B	ammonia	oxygen
C	chlorine	hydrogen
D	chlorine	oxygen

40 Which aqueous ion gives a blue precipitate when aqueous sodium hydroxide is added?

A Ca^{2+} **B** Cr^{3+} **C** Cu^{2+} **D** Fe^{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.).