



Cambridge IGCSE™

CHEMISTRY

0620/11

Paper 1 Multiple Choice (Core)

October/November 2020

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. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

This document has **16** pages. Blank pages are indicated.



- 1 'The movement of a substance **very slowly** from an area of high concentration to an area of low concentration.'

Which process is being described?

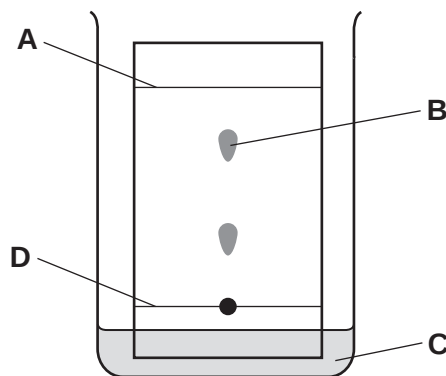
- A a liquid being frozen
 B a solid melting
 C a substance diffusing through a liquid
 D a substance diffusing through the air
- 2 What happens to the average speed of gas particles when pressure and temperature are increased?

	average speed of particles	
	pressure increases	temperature increases
A	faster	faster
B	unchanged	slower
C	slower	faster
D	unchanged	faster

- 3 Which piece of apparatus can only measure a single fixed volume?

- A 250 cm³ beaker
 B 50 cm³ burette
 C 100 cm³ measuring cylinder
 D 25 cm³ pipette

- 4 In the chromatography experiment shown, which label represents the solvent front?



5 Which substances can be separated by filtration?

- A insoluble liquid and water
- B insoluble solid and water
- C solution of soluble liquid in water
- D solution of soluble solid in water

6 An atom of element R contains 15 protons, 16 neutrons and 15 electrons.

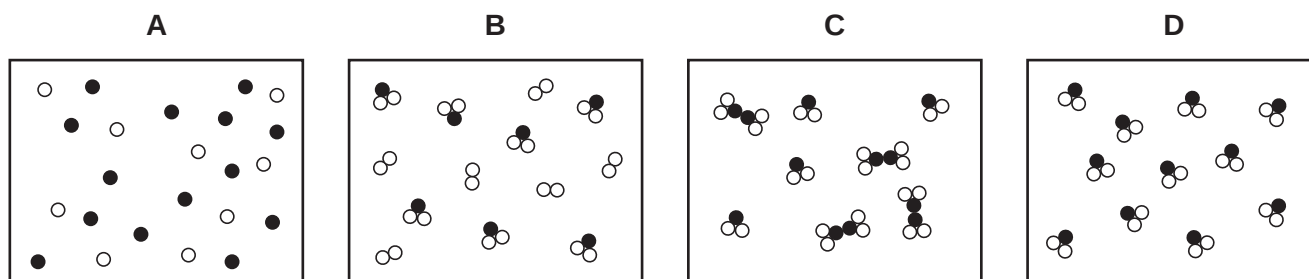
What is R?

- A gallium
- B phosphorus
- C sulfur
- D zinc

7 Which row describes the properties of potassium iodide, KI?

	type of bonding	boiling point	solid conducts electricity	aqueous solution conducts electricity
A	covalent	low	no	no
B	covalent	high	no	yes
C	ionic	high	yes	yes
D	ionic	high	no	yes

8 Which diagram represents a mixture of compounds?



- 9 Rubidium is in Group I of the Periodic Table and bromine is in Group VII.

Rubidium reacts with bromine to form an ionic compound.

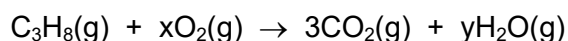
Which row shows the electron change taking place for rubidium and the correct formula of the rubidium ion?

	electron change	formula of ion formed
A	electron gained	Rb^+
B	electron gained	Rb^-
C	electron lost	Rb^+
D	electron lost	Rb^-

- 10 Which statement explains why graphite is used as a lubricant?

- A** All bonds between the atoms are weak.
- B** It conducts electricity.
- C** It has a low melting point.
- D** Layers in the structure can slide over each other.

- 11 The equation for burning propane in air is shown.



Which values of x and y balance the equation?

	x	y
A	3	4
B	4	8
C	5	4
D	10	8

- 12 The relative atomic mass of chlorine is 35.5.

When calculating relative atomic mass, which particle is the mass of a chlorine atom compared to?

- A** a neutron
- B** a proton
- C** an atom of carbon-12
- D** an atom of hydrogen-1

- 13** Concentrated aqueous sodium chloride is electrolysed using platinum electrodes.

What is the major product formed at each electrode?

	anode	cathode
A	chlorine	hydrogen
B	chlorine	sodium
C	oxygen	hydrogen
D	oxygen	sodium

- 14** Three substances are listed.

- 1 copper
- 2 dilute sulfuric acid
- 3 solid lead(II) bromide

Which substances conduct electricity?

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

- 15** Sodium nitrate is added to water in a beaker and stirred until it dissolves.

At the end of the experiment, the beaker feels cold.

Which row describes the reaction?

	temperature of solution	type of reaction
A	decreases	endothermic
B	decreases	exothermic
C	increases	endothermic
D	increases	exothermic

- 16** Which substance does **not** require oxygen in order to produce energy?

- A** coal
B hydrogen
C natural gas
D ^{235}U

17 Which process involves a physical change?

- A heating calcium carbonate
- B burning wood
- C melting an ice cube
- D mixing an acid and a base

18 A sign displayed in a flour mill is shown.

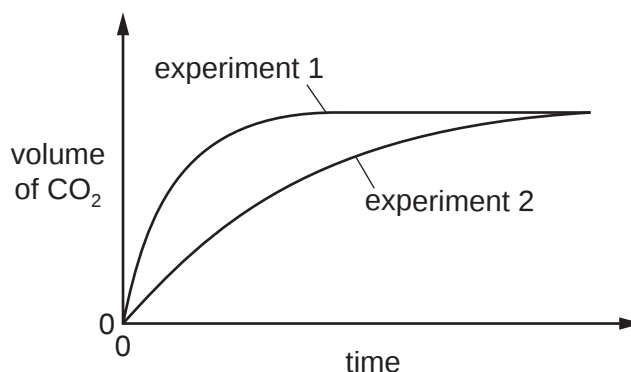


Which statement explains why there is a danger of explosion in a flour mill?

- A Flour burns very quickly because it is a fine powder.
- B Flour is a catalyst for combustion.
- C Flour mills get hot and speed up the rate of combustion.
- D The combustion of flour is exothermic.

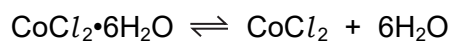
- 19 The graph shows the results of two experiments investigating the rate of reaction between excess calcium carbonate and dilute hydrochloric acid.

In each experiment the volume of carbon dioxide produced is measured at fixed time intervals.



Which statement describes the difference in conditions between experiments 1 and 2?

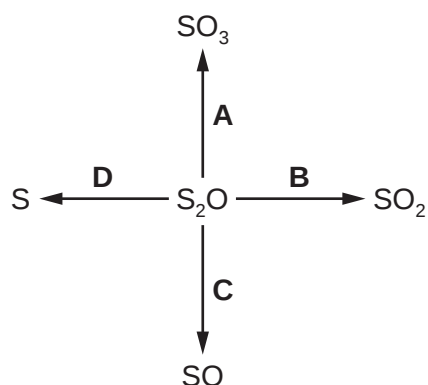
- A In experiment 2 a higher concentration of dilute hydrochloric acid is used.
 - B In experiment 2 a higher temperature is used.
 - C In experiment 2 the mass of calcium carbonate is greater.
 - D In experiment 2 the particle size of calcium carbonate is greater.
- 20 When pink crystals of cobalt(II) chloride are heated, steam is given off and the colour of the solid changes to blue.



What happens when water is added to the blue solid?

	colour	temperature
A	changes to pink	decreases
B	changes to pink	increases
C	remains blue	decreases
D	remains blue	increases

21 In which change is the sulfur, S, in sulfur(I) oxide, S_2O , reduced?



22 What is a characteristic of acids?

- A** Acids turn methyl orange indicator yellow.
- B** Acids have a high pH value.
- C** Acids react with ammonium salts to give ammonia gas.
- D** Acids react with carbonates to produce salts.

23 Four different groups of oxides are shown.

1 MgO FeO CuO

2 CaO SO_2 TiO_2

3 PbO CaO Cl_2O

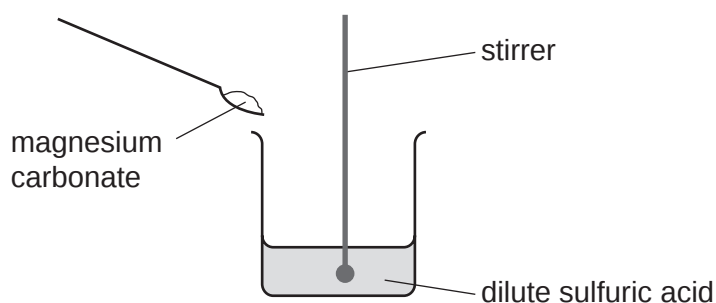
4 NO_2 Br_2O P_2O_5

Which statement about these oxides is correct?

- A** 1, 2 and 3 contain basic oxides only.
- B** 2, 3 and 4 contain basic oxides only.
- C** 1 contains basic oxides only and 4 contains acidic oxides only.
- D** 1 contains acidic oxides only and 4 contains basic oxides only.

- 24** A student carries out an experiment to prepare pure magnesium sulfate crystals.

The diagram shows the first stage of the preparation.



He adds magnesium carbonate until no more reacts.

Which process should he use for the next stage?

- A** crystallisation
B evaporation
C filtration
D neutralisation

- 25** Which ion produces a green precipitate when aqueous sodium hydroxide is added?

- A** Cu^{2+} **B** Fe^{2+} **C** Fe^{3+} **D** Zn^{2+}

- 26** The positions of four elements in the Periodic Table are shown.

Which element is a gas that displaces iodine from sodium iodide?

A simplified periodic table with 18 columns and 4 rows. The first two columns are on the left, and the last two are on the right. The middle 14 columns are connected by a single line. The letters A, B, C, and D are placed in specific cells: A is in the first column, second row; B is in the first column, fourth row; C is in the 16th column, second row; and D is in the 17th column, second row.

27 A flammable gas needs to be removed from a tank at an industrial plant.

For safety reasons, an inert gas is used.

Which gas is suitable?

- A** argon
- B** hydrogen
- C** methane
- D** oxygen

28 A substance, X, has the following properties.

- 1 It has a high melting point.
- 2 It conducts electricity in the solid and liquid states.
- 3 It is malleable.
- 4 It has a high density.

What is X?

- A** a ceramic
- B** copper
- C** graphite
- D** sodium chloride

29 A reactivity series is shown.

sodium
calcium
magnesium
carbon
zinc
iron
hydrogen
copper

Which statement is correct?

- A** All the metals above carbon are extracted by electrolysis.
- B** Iron can only be extracted by electrolysis.
- C** Calcium can be extracted by heating calcium oxide with carbon.
- D** Copper can only be extracted by passing hydrogen over heated copper(II) oxide.

30 What is the symbol of the metal used in the manufacture of aircraft because of its strength and low density?

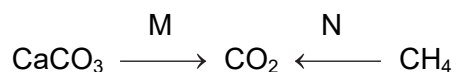
- A** Al **B** Cu **C** Fe **D** Zn

31 Oxides of nitrogen are given out from car exhausts.

Which row best shows why oxides of nitrogen are unwanted in the atmosphere?

	acidic	toxic
A	no	no
B	no	yes
C	yes	no
D	yes	yes

32 Two reactions, M and N, both form carbon dioxide.



Which types of reaction are M and N?

	M	N
A	thermal decomposition	thermal decomposition
B	thermal decomposition	combustion
C	combustion	thermal decomposition
D	combustion	combustion

33 Which row describes two uses of sulfur dioxide?

	use 1	use 2
A	bleaching paper pulp	neutralising acidic industrial waste
B	bleaching paper pulp	preserving food and drink
C	extracting iron from hematite	neutralising acidic industrial waste
D	extracting iron from hematite	preserving food and drink

34 Which statement about lime and limestone is correct?

- A** Calcium oxide is formed from limestone in a displacement reaction.
- B** Lime is used to treat alkaline soils.
- C** Limestone is a waste material in the manufacture of iron.
- D** Slaked lime is used in the process of flue gas desulfurisation.

35 Which compound has a chemical name ending in *-oic acid*?

- A** $\text{C}_2\text{H}_5\text{OH}$
- B** C_2H_6
- C** CH_3COOH
- D** C_2H_4

36 Petroleum is separated into fractions by fractional distillation.

Separation occurs in a fractionating column.

Some properties of three of these fractions are shown.

fraction	boiling point range / °C	number of carbon atoms in the molecules
1		5–10
2	320–350	16–24
3	120–210	

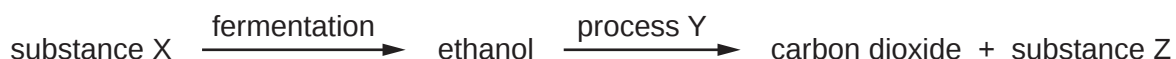
Which statement is correct?

- A** Fraction 1 has a higher boiling point range than fraction 2.
- B** Fraction 2 is removed from a higher point in the fractionating column than fraction 1.
- C** Molecules in fraction 3 have shorter chains than those in fraction 2.
- D** None of the fractions are liquid at room temperature.

37 Which statement about alkenes is correct?

- A** Alkenes are saturated hydrocarbons.
- B** Alkenes can be made by cracking other hydrocarbon compounds.
- C** Alkenes change bromine water from colourless to brown.
- D** Alkene molecules contain double bonds between carbon atoms and hydrogen atoms.

38 The flow chart shows the preparation of ethanol and some important chemistry of ethanol.



What are X, Y and Z?

	X	Y	Z
A	yeast	combustion	oxygen
B	glucose	combustion	steam
C	glucose	polymerisation	water
D	yeast	fermentation	glucose

39 Which statements about aqueous ethanoic acid are correct?

- 1 It is an alkane.
- 2 It reacts with sodium carbonate to form carbon dioxide.
- 3 It changes the colour of litmus solution from blue to red.
- 4 It is a hydrocarbon.

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

40 Which substance is a polymer?

- A** diamond
- B** graphite
- C** nylon
- D** sodium chloride

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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	atomic number atomic symbol name relative atomic mass										5	6	7	8	9	10
11	Na sodium 23	12	Mg magnesium 24											13	14	15	16	17	18
														Al aluminium 27	Si silicon 28	P phosphorus 31	S sulfur 32	Cl chlorine 35.5	Ar argon 40
														31	32	33	34	35	36
														Ga gallium 70	Ge germanium 73	As arsenic 75	Se selenium 79	Br bromine 80	Kr krypton 84
														49	50	51	52	53	54
														In indium 115	Sn tin 119	Sb antimony 122	Te tellurium 128	I iodine 127	Xe xenon 131
														81	82	83	84	85	86
														Tl thallium 204	Pb lead 207	Bi bismuth 209	Po polonium —	At astatine —	Rn radon —
														112	114		116		
														Cn copernicium —	Fl flerovium —		Lv livermorium —		