



**MAURITIUS
EXAMINATIONS
SYNDICATE**

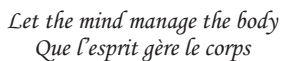
NATIONAL CERTIFICATE OF EDUCATION

SCIENCE

CHEMISTRY

Specimen paper
for first assessment in October 2020

	Question	LOs	Page No in textbook	AO1 - Knowledge with Understanding			AO2 -Application			AO3 -Scientific Inquiry			TOTAL
				Basic	Intermediate	Proficient	Basic	Intermediate	Proficient	Basic	Intermediate	Proficient	
Atmosphere and the Environment													
	1(4)	Discuss the importance of photosynthesis	4				1						1
	1(7)	Show understanding of eutrophication	25		1								1
	2(a)	State sources and effects of the list air pollutants	15-23				4						4
	2(b)		2		4								4
	5(b)(ii)	Explain causes and effects of acid rain and global warming	15						1				1
	5(b)(iii)	State the sources and effects of the listed air pollutants	15		1								1
	5(b)(iv)	Explain causes and effects of acid rain and global warming	17			1							1
	5(b)(i)	Identify carbon monoxide, oxides of nitrogen, sulfur dioxide	15										
	1(1)		34	1						1			1
Mixtures and Separation techniques		Give labelled illustrations to show and explain how these techniques are carried out	48&52										1
	1(9)			1									1
	3(a)(i)	Give labelled illustration (filtration)	36-37	4									4
		Investigate how mixtures can be separated into their respective components	35										1
	3(a)(ii)			1									1
	3(b)(i)	Investigate how mixtures can be separated into their respective components	39						1				1
		Investigate how mixtures can be separated into their respective components											
	3(b)(ii)	Investigate how mixtures can be separated into their respective components	39								1		1
	1(5)	Work out formulae of compounds	3				1						1
	1(10)	Work out formulae of compounds	7		1								1

[illegible]

Index Number:

NATIONAL CERTIFICATE OF EDUCATION

Specimen paper for first assessment in October 2020

SCIENCE (N 530)
CHEMISTRY SECTION

TIME: 45 MINUTES

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

1. Write your Index number in the space provided above.
2. Write in dark blue or black ink.
3. Answer **all** questions.
4. All answers must be written in the spaces provided.
5. Any rough working should be done in this booklet.
6. Do not use correction fluid.
7. The total of the marks for this paper is **50**.

The number of marks is given in brackets [] at the end of each question or part question.

8. Check that this assessment booklet consists of **5** questions printed on **10** pages from pages 2 to 11.
9. A copy of the Periodic Table is printed on page 12.
10. Any discrepancy in the document must be immediately notified to the invigilator.

QUESTION 1: MULTIPLE CHOICE QUESTIONS (10 MARKS)

Circle the correct answer

1. Which **one** of the following is a mixture?

A Sugar

B Air

C Distilled water

D Carbon dioxide

2. Which **one** of the following elements is a metal?

A Aluminium

B Carbon

C Oxygen

D Phosphorus

3. What is the colour of the flame when magnesium burns in oxygen?

A Blue

B Green

C White

D Yellow

4. **Figure 1.1** represents the carbon cycle. The process which removes carbon dioxide from air is known as

A burning

B decomposition

C photosynthesis

D respiration

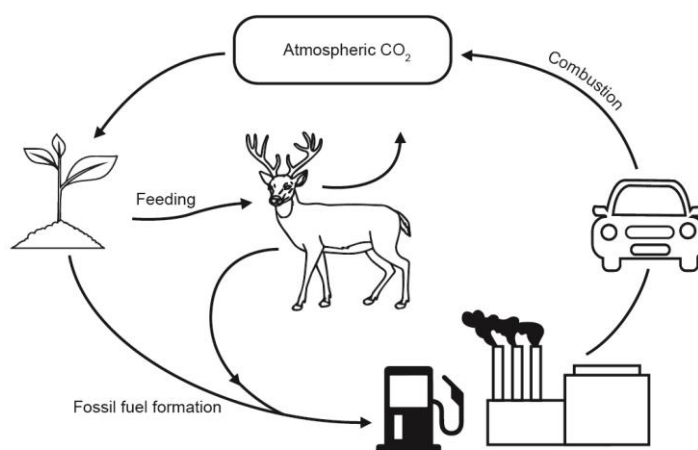


Figure 1.1

5. How many carbon and chlorine atoms are present in the molecule shown in **Figure 1.2**?

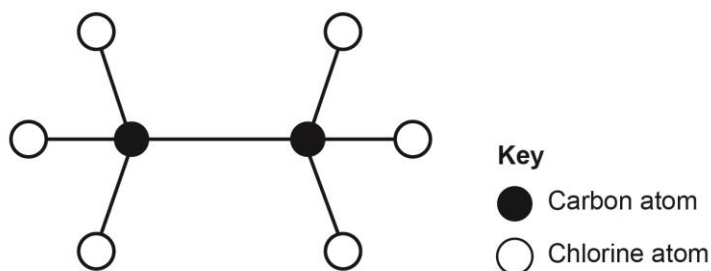


Figure 1.2

	Carbon atoms	Chlorine atoms
A	3	5
B	2	6
C	6	2
D	5	3

6. Which **one** of the following is a soluble salt?
- A Barium sulfate B Lead iodide
C Silver chloride D Sodium nitrate
7. The use of an excess of fertilisers in fields results in the phenomenon shown in **Figure 1.3**. This phenomenon is known as

- A** eutrophication
B neutralisation
C erosion
D decantation

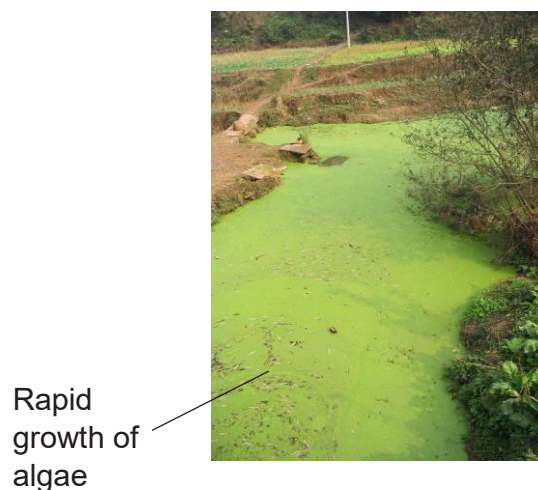


Figure 1.3

9. **Figure 1.4** shows two different separation techniques, **X** and **Y**.

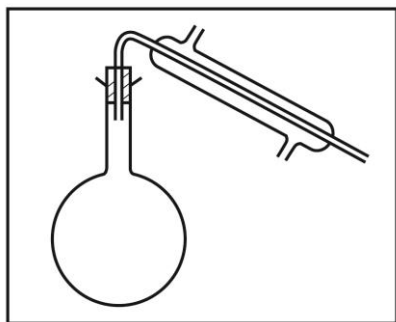


Figure 1.4

What is the name given to each method?

	X	Y
A	chromatography	distillation
B	filtration	chromatography
C	distillation	filtration
D	distillation	chromatography

10. For which radical are the formula and valency correct?

	Radical	Formula	Valency
A	sulfate	SO ₄	3
B	sulfate	SO ₄	2
C	nitrate	NO ₃	2
D	nitrate	NO ₃	3

QUESTION 2 (8 MARKS)

(a) **Match** the name of each air pollutant to its corresponding effect.

Air pollutants	Effects
Chlorofluorocarbon ●	● causes global warming
Sulfur dioxide ●	● causes headaches, dizziness and even death
Methane ●	● depletes the ozone layer
Carbon monoxide ●	● causes brain damage
	● causes acid rain

[4]

(b) Complete the table below.

Gas in clean air	Approximate percentage
.....	21%
Nitrogen	
.....	0.03%
Noble gases	

[4]

QUESTION 3 (7 MARKS)

- (a) **Figure 3.1** shows a separation technique used to obtain clear water from muddy water.

- (i) **Label Figure 3.1** using the appropriate word from the list below:

Conical flask, Residue, Filtrate, Beaker, Funnel

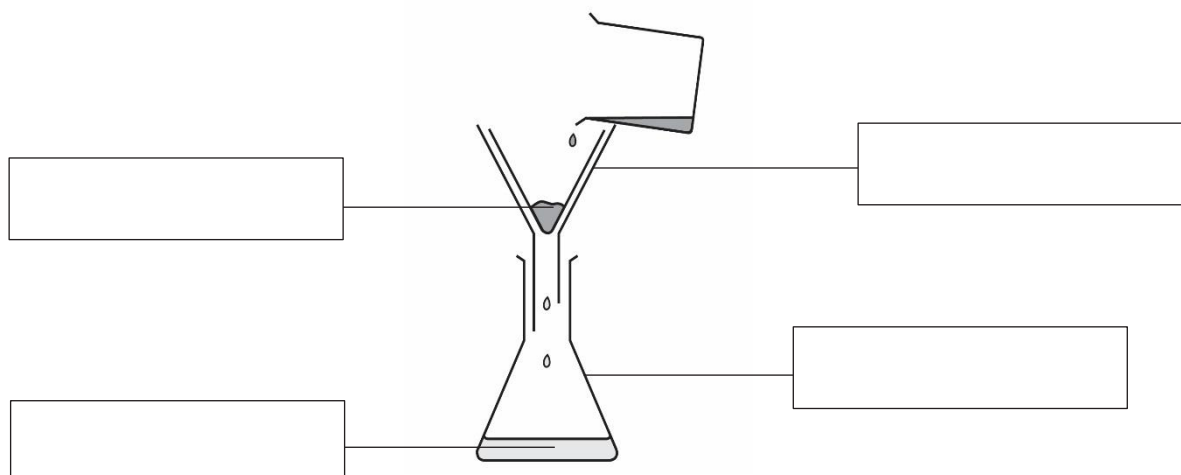


Figure 3.1

[4]

- (ii) Name the separation technique shown in **Figure 3.1**.

[1]

- (b) (i) Which **one** of the following mixtures can be separated using the above separation technique? **Tick (✓)** the correct answer.

Water and ink ☐

Water and alcohol ☐

Water and sand ☐

[1]

- (ii) Explain your answer to part (b)(i).

[1]

QUESTION 4 (12 MARKS)

(a) Write down the **formulae** of the following compounds:

(i) Sodium chloride: _____

(ii) Iron (III) oxide: _____

(iii) Calcium hydroxide: _____

[3]

(b) Write the missing names of compounds in the word equation below:



Magnesium + _____ $\longrightarrow$ _____ + Hydrogen

[2]

(c) (i) Define neutralisation.

[1]

(ii) State one application of neutralisation in everyday life.

[1]

- (d) Reshma adds some calcium granules to a beaker containing water. The setup of the experiment is shown in **Figure 4.1**.

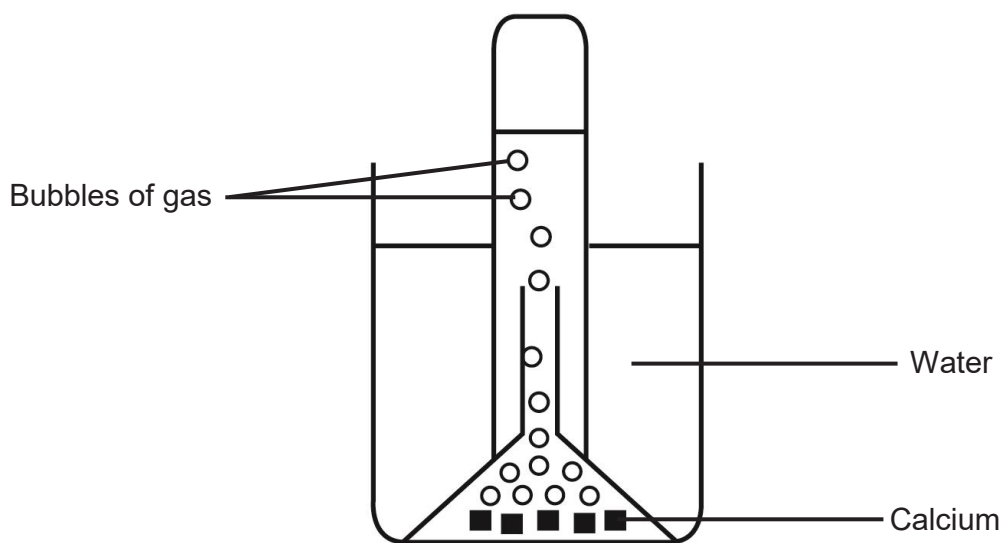


Figure 4.1

- (i) Give **two** observations that Reshma will make during the reaction.

Observation 1: _____

Observation 2: _____

[2]

- (ii) Name the gas produced in the above experiment.

[1]

- (iii) The gas produced is flammable. Give a safety precaution related to this hazard that Reshma should take.

[1]

- (iv) Reshma repeats the experiment using silver metal instead of calcium. Explain why no reaction occurs.

[1]

QUESTION 5 (13 MARKS)

(a) **Figure 5.1** shows two reactions of zinc.

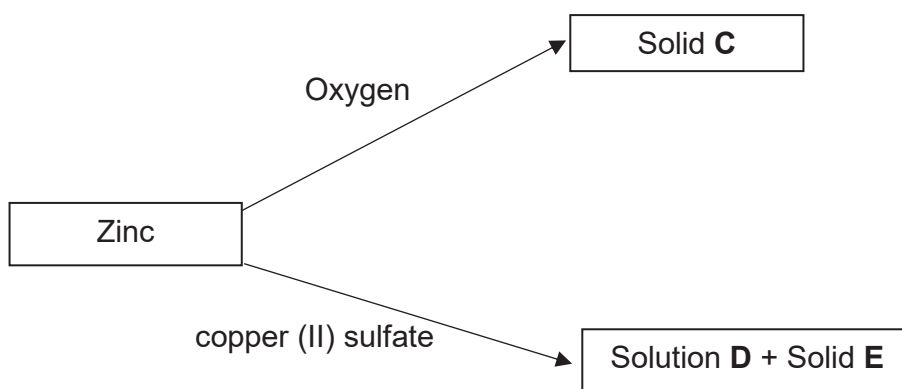


Figure 5.1

(i) Name Solid **C**.

Solid C: _____ [1]

(i) Name Solution **D**.

Solution D: _____ [1]

(iii) State the colour of Solid **E** formed when excess zinc is added to copper (II) sulphate solution.

Colour: _____ [1]

(iv) Name the **type** of reaction that takes place between zinc and aqueous copper sulphate.

Type of reaction: _____ [1]

- (b) Copper metal reacts with concentrated nitric acid according to the equation given below.



A brown gas is produced during the reaction.

- (i) Name the brown gas.

_____ [1]

- (ii) This gas is an atmospheric pollutant. Describe how it forms acid rain.

- (iii) Give one natural source of this brown gas.

[1]

_____ [1]

- (iv) Give one consequence of acid rain formation.

_____ [1]

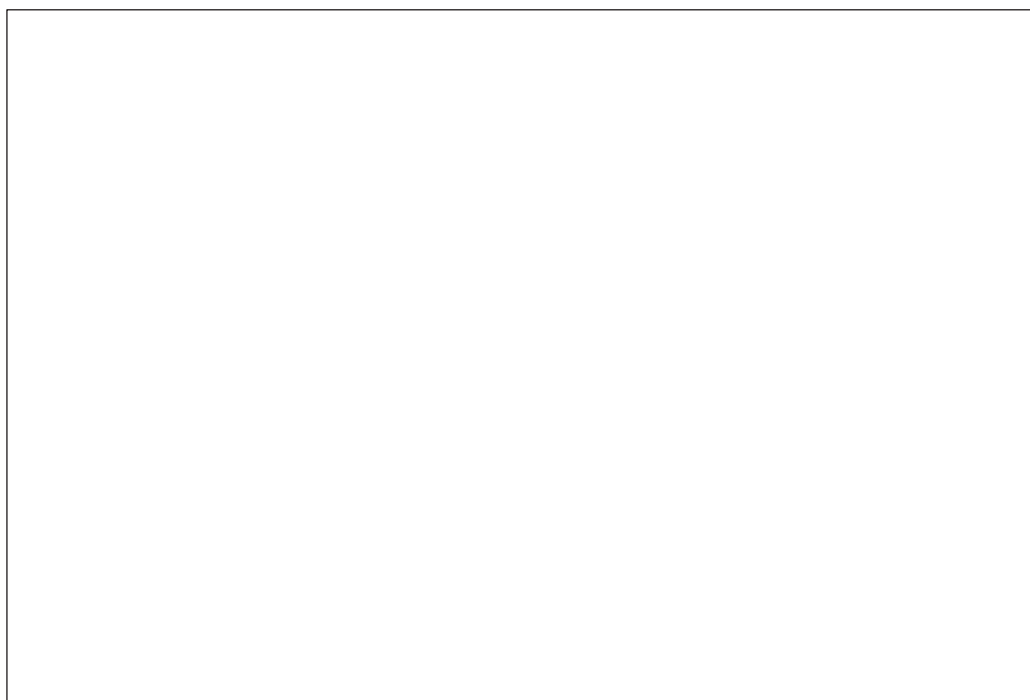
- (c) Kevin proposes the following hypothesis:

"Iron reacts with dilute sulfuric acid while copper does not react."

Devise a simple experiment to test his hypothesis.

- (i) Draw the setup of the experiment you would perform.
Label your diagram.

[2]



- (ii) State one observation made with each metal.

Iron: _____

Copper : _____

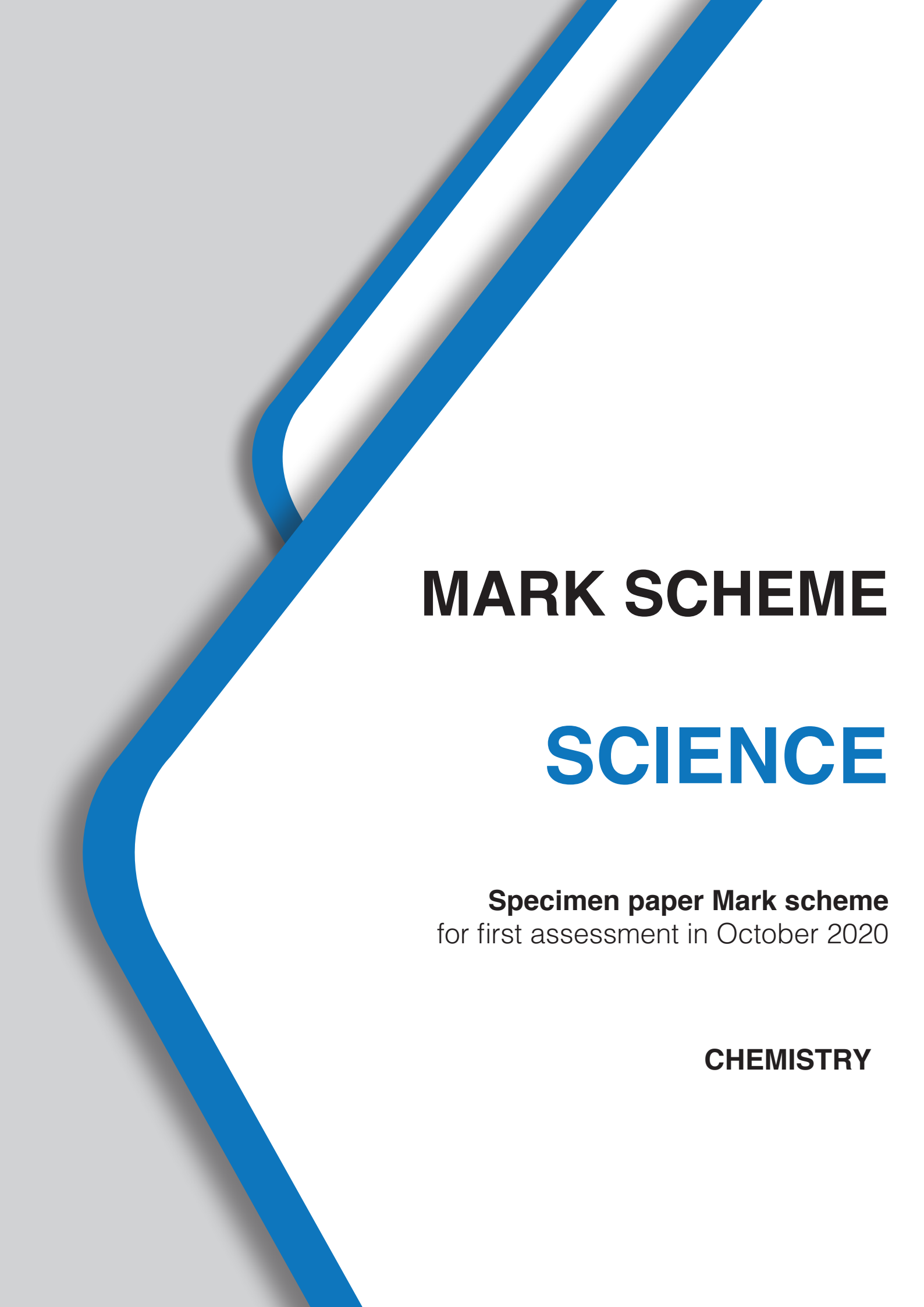
[2]

- (iii) Using your observations to part (d)(ii), state whether you accept Kevin's hypothesis.

[1]

The Periodic Table of Elements

Group																												
I	II	H hydrogen										III	IV	V	VI	VII	VIII											
Li lithium	Be beryllium												B boron	C carbon	N nitrogen	O oxygen	F fluorine	Ne neon										
Na sodium	Mg magnesium												Al aluminium	Si silicon	P phosphorus	S sulfur	Cl chlorine	Ar argon										
K potassium	Ca calcium												Sc scandium	Ti titanium	V vanadium	Cr chromium	Mn manganese	Fe iron	Co cobalt	Ni nickel	Cu copper	Zn zinc	Ga gallium	Ge germanium	As arsenic	Se selenium	Br bromine	Kr krypton
Rb rubidium	Sr strontium												Y yttrium	Zr zirconium	Nb niobium	Mo molybdenum	Tc technetium	Ru ruthenium	Rh rhodium	Pd palladium	Ag silver	Cd cadmium	In indium	Sn tin	Sb antimony	Te tellurium	I iodine	Xe xenon
Cs caesium	Ba barium	lanthanoids		Hf hafnium	Ta tantalum	W tungsten	Re rhenium	Os osmium	Ir iridium	Pt platinum	Au gold	Hg mercury	Tl thallium	Pb lead	Bi bismuth	Po polonium	At astatine	Rn radon										
Fr francium	Ra radium	actinoids		Rf rutherfordium	Db dubnium	Sg seaborgium	Bh bohrium	Hs hassium	Mt meitnerium	Ds darmstadtium	Rg roentgenium	Cn copernicium		Fl flerovium		Lv livermorium												



MARK SCHEME

SCIENCE

Specimen paper Mark scheme
for first assessment in October 2020

CHEMISTRY

NATIONAL CERTIFICATE OF EDUCATION – SPECIMEN PAPER

MARK SCHEME

Question 1	Answer	Marks
1	B	1
2	A	1
3	C	1
4	C	1
5	B	1
6	D	1
7	A	1
8	A	1
9	D	1
10	B	1

Question	Answer	Marks
2(a)	Chlorofluorocarbon Sulfur dioxide Methane Carbon monoxide causes global warming causes headaches, dizziness and death depletes the ozone layer causes brain damage causes acid rain	1 mark for each correct matching
2(b)	Oxygen - 21% Nitrogen - 78 % Carbon dioxide - 0.03% Noble gases - 0.96 %	1 1 1 1

Question	Answer	Marks
3(a)(i)	IN CORRECT ORDER Funnel Residue Conical flask Filtrate	 1 1 1 1
3(a)(ii)	Filtration	1
3(a)(iii)	Tick - Water and sand	1
	Sand is insoluble in water/ Sand does not dissolve in water/ Ink/alcohol dissolves/ is soluble in water	1 ORA

Question	Answer	Marks
4(a)(i)	NaCl	1
4(a)(ii)	Fe ₂ O ₃	1
4(a)(iii)	Ca(OH) ₂	1

4(b)	IN CORRECT ORDER Hydrochloric acid Magnesium chloride	1 1	
4(c)(i)	Neutralisation is the reaction between an acid and a base/alkali to form a salt and water.	1	
4(c)(ii)	Treatment of indigestion Treatment of insect stings/bites Treatment of soil Treatment of acidic gases	1 ORA	
4(d)(i)	Bubbles of gas are seen. / Effervescence is observed. Calcium dissolves./ Calcium decreases in size.	1 1	
4(d)(ii)	Hydrogen	1	Award 0 if formula given
4(d)(iii)	The experiment should be carried out away from a naked/direct flame.	1	
4(d)(iv)	Silver is an unreactive metal / Silver is lower than hydrogen in the reactivity series	1	

Question	Answer	Marks
5(a)(i)	Zinc oxide	1
5(a)(ii)	Zinc sulfate	1
5(a)(iii)	Red pink/ pink/ Red brown/pink brown	1
5(a)(iv)	Displacement reaction/ Redox reaction	1
5(b)(i)	Nitrogen dioxide	1
5(b)(ii)	The gas dissolves/reacts in rain water/water to form acid rain/acid.	1
5(b)(iii)	Lightning	1
5(b)(iv)	Acid rain damages/corrodes/ erodes limestone buildings, statues and monuments/ Acid corrodes steel structures like cars, iron roofs and iron bridges/ Acid rain renders soil acidic and kills plants/ Acid rain makes water in lakes and rivers more acidic which kills fish and other aquatic animals	1
5(c)(i)	Drawing of correct diagram with iron and copper in separate apparatus	1
	Labelling of diagram	1

5(c)(ii)	Iron: Bubbles of gas seen/ effervescence seen/ Iron dissolves/ Colour of solution changes Copper: No bubbles of gas seen/ Solution remains colourless/ No change in colour of solution/ Copper does not dissolve	1 1 ORA
5(c)(iii)	Yes, accept the hypothesis	1

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