Let the mind manage the body
Que l'esprit gère le corps

Index Number: .....

NATIONAL CERTIFICATE OF EDUCATION

2023

CHEMISTRY (N530)

TIME: 45 MINUTES

Candidates answer on the Question Paper.
Additional Material: Ruler, Calculator

READ THESE INSTRUCTIONS FIRST

1. Write your index number in the space provided above.
2. Write in dark blue or black ink. Do not use correction fluid.
3. You may use a soft pencil for any diagram, graph or rough working.
4. Diagrams are not drawn to scale unless otherwise specified.
5. Any rough working should be done in this booklet.
6. Answer **ALL** questions.
7. This document consists of **5** questions printed on **10** pages, numbered **2** to **11**.
8. A copy of the Periodic Table is provided on page **12.**
9. The total number of marks for this paper is **50**.

For Examiners' use							
Question No.	**1**	**2**	**3**	**4**	**5**	**Total**	**Signature**
Examiner							
Team Leader							
CE/ACE							

Marks

Question 1 (10 marks)

Circle the correct answer. Each item carries one mark.

1. What does **Fig. 1.1** show?

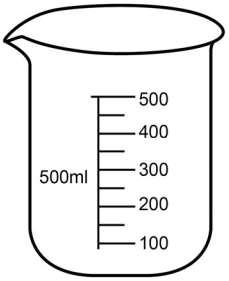


Fig. 1.1

A A beaker

B A condenser

C A conical flask

D A distillation flask

2. **Fig. 1.2** shows a **factory** releasing carbon dioxide.

By which process does the factory release carbon dioxide?

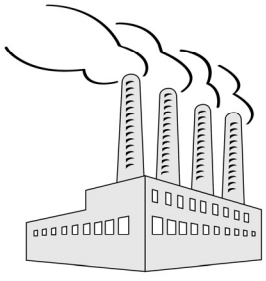


Fig. 1.2

A Combustion

B Eutrophication

C Photosynthesis

D Respiration

3. Which one of the following is a **greenhouse** gas?

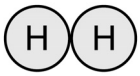
A Hydrogen

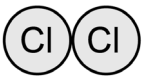
B Methane

C Nitrogen

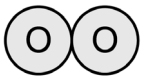
D Oxygen

4. Which one of the following represents an **oxygen** molecule?

A 

B 

C 

D 

5. **Fig. 1.3** shows a water molecule.

How many **atoms** combine to form a water molecule?

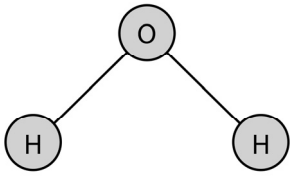


Fig. 1.3

A 2

B 4

C 3

D 6

6. What is the valency of hydrogen?

A 1

B 2

C 3

D 4

Marks

7. **Fig. 1.4** shows a piece of magnesium ribbon burning in air.

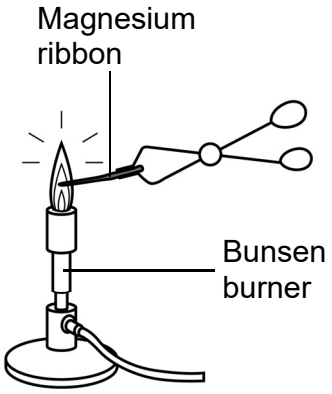


Fig. 1.4

What is the colour of the flame when magnesium burns in air?

A Blue **B** Green

C Red **D** White

8. Study **Fig. 1.5**.

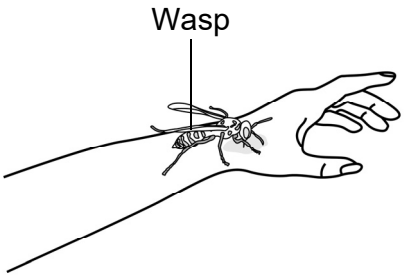


Fig. 1.5

Which one of the following can be used to treat a wasp sting?

A Baking soda **B** Quicklime

C Slaked lime **D** Vinegar

Marks

9. Which salt is used to make the **plaster of Paris**, shown in **Fig. 1.6**?

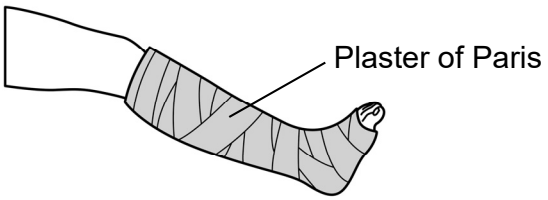


Fig. 1.6

A Ammonium nitrate

B Calcium sulfate

C Magnesium sulfate

D Potassium nitrate

E

TL

CE

10. What are the products of a **neutralisation** reaction?

A Acid and base

B Acid and salt

C Base and water

D Salt and water

Marks

Question 2 (9 marks)

(a) Match the symbol of each element to its correct name.

You may use the Periodic Table on page 12.

Symbol	Name
N	mercury
C	hydrogen
Cl	nitrogen
H	sodium
Hg	chlorine
	carbon

[5]

(b) Complete the following word equations by choosing the correct compound in brackets.

(i) calcium + oxygen ⟶ _____
(calcium oxide, calcium chloride)

(ii) sodium + chlorine ⟶ _____
(sodium oxide, sodium chloride)

(iii) sulfur + oxygen ⟶ _____
(sodium oxide, sulfur dioxide)

(iv) magnesium + sulfuric acid ⟶ _____ + hydrogen
(magnesium chloride, magnesium sulfate)

[4]

E
TL
CE

Marks

Question 3 (9 marks)

(a) Identify the effects of **global warming** shown in each picture below. Fill in the blanks with the given words or phrases.

Melting of ice-caps **Depletion of ozone layer** **Droughts** **Flash floods**

1. _____ 2. _____

3. _____

[3]

(b) Circle the **two** air pollutants from the list below.

CFCs **Oxygen** **Smoke** **Nitrogen**

[2]

(c) Write down whether the statements given below are **TRUE** or **FALSE**.

(i) Sewage contains harmful bacteria. _____ [1]

(ii) During volcanic eruptions, sulfur dioxide is released. _____ [1]

(iii) Carbon monoxide is a water pollutant. _____ [1]

(iv) Oil spill is a cause of water pollution. _____ [1]

E

TL

CE

Marks

Question 4 (10 marks)

Fig. 4.1 shows a chromatogram of four different food colourings, **P**, **Q**, **R** and **S**, containing different dyes.

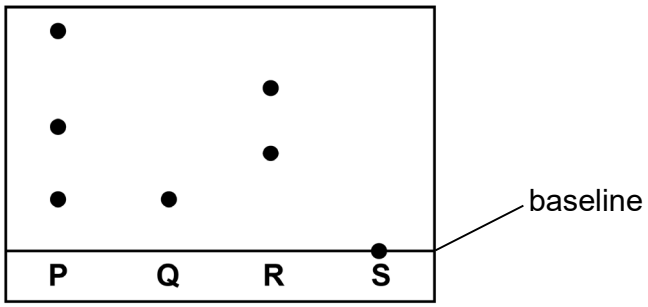


Fig. 4.1

(a) (i) How many dyes are present in food colouring **P**?

_____ [1]

(ii) What shows that dye **Q** is a pure dye?

_____ [1]

(iii) Why has food colouring **S** not been separated during chromatography?

_____ [1]

(b) (i) One precaution to be taken during chromatography is to ensure that the spot of the food colouring to be separated is small. Explain why.

_____ [1]

(ii) Give **another** precaution to be taken during chromatography.

_____ [1]

Marks

(c) **Fig. 4.2** shows an apparatus used for the sublimation process.

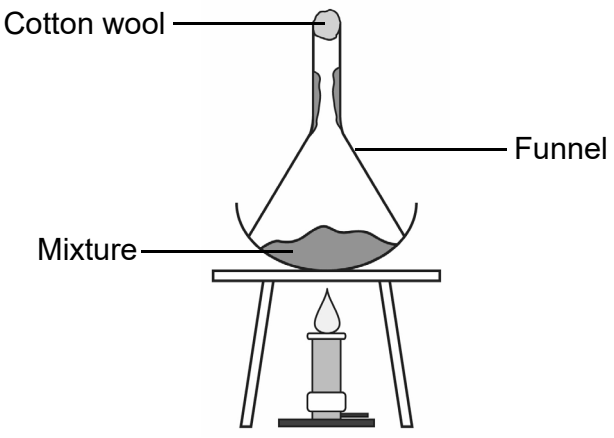


Fig. 4.2

(i) What is the **change of state** that takes place during sublimation?

_____ [1]

(ii) Give an example of a mixture that can be separated by sublimation.

_____ [1]

(iii) Why should the narrow end of the funnel be closed with cotton wool in **Fig. 4.2**?

_____ [1]

(d) Name two insoluble salts.

1. _____

2. _____ [2]

E

TL

CE

Marks

Question 5 (12 marks)

(a) Write the chemical formula for each of the following compounds.

(i) Aluminium sulfate : _____

(ii) Iron (III) nitrate : _____ [2]

(b) Balance the following chemical equations.

(i) $CaCO_3 + HCl \longrightarrow CaCl_2 + CO_2 + H_2O$

(ii) $CH_4 + O_2 \longrightarrow CO_2 + H_2O$

(iii) $Fe + O_2 \longrightarrow Fe_2O_3$

[3]

(c) An iron nail is placed in a boiling tube containing copper (II) sulfate solution as shown in **Fig. 5.1**.

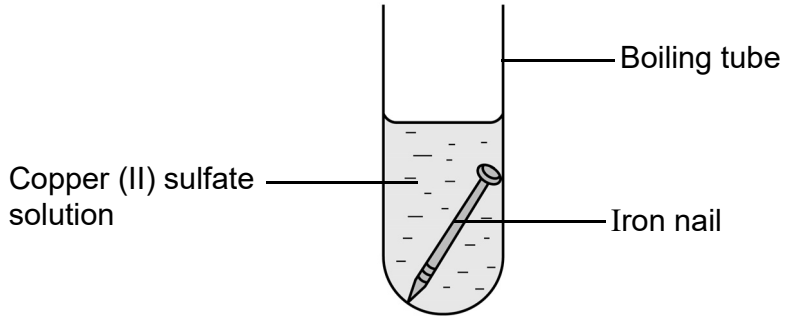


Fig. 5.1

(i) At the end of the reaction, a solid is deposited on the iron nail. Name this solid.

_____ [1]

(ii) What is the name given to this type of chemical reaction?

_____ [1]

Marks

(d) A student investigates the reaction of magnesium with steam. The apparatus is set up as shown in **Fig. 5.2**.

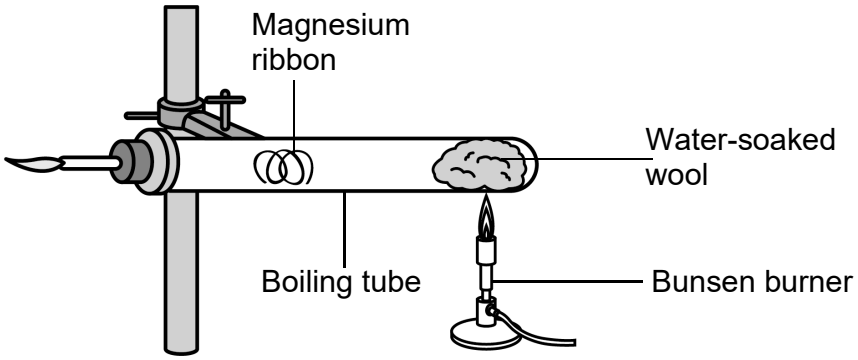


Fig. 5.2

(i) What is the colour of the solid left in the boiling tube at the end of the reaction?

_____ [1]

(ii) Write a balanced chemical equation for the above reaction.

_____ [2]

(iii) The experiment is repeated using a copper strip instead of the magnesium ribbon. Will a reaction take place? Justify your answer.

_____

_____ [2]

E

TL

CE

The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							H hydrogen										He helium
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		