

KAPSABET HIGH SCHOOL



POST MOCK 2024



CHEMISTRY

233/1 (THEORY)

PAPER 1

TIME: 2 HOURS

NAME..... SIGN.....

INDEX NO..... ADM NO.....

Kenya Certificate of Secondary Education.

INSTRUCTIONS TO CANDIDATES

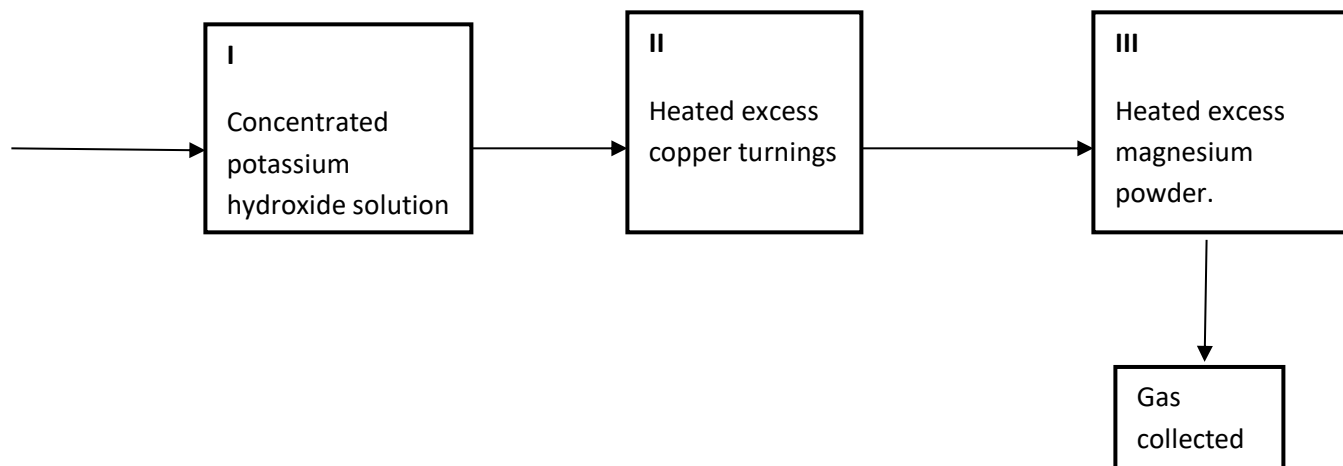
- Write your **name** and **index number** in the spaces provided above.
- **Sign** and write the **date of examination** in the spaces provided above.
- Answer **ALL** the questions in the spaces provided.
- **Mathematical tables and electronic calculators may be used.**
- All working **MUST** be clearly shown where necessary.

FOR EXAMINERS USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1 – 31	80	

Answer **ALL** the questions in the spaces provided

1. Air passed through several reagents as shown below



a) What is the role of conc potassium hydroxide?

(1mk)

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b) Write an equation that takes place in step III with Magnesium powder.

(1mk)

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c) Name one gas that was collected from the process.

(1mk)

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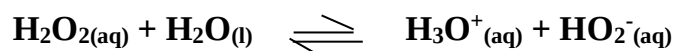
2. Name two examples of physical changes.

(2mks)

3. A gas at 27°C and 750mmHg pressure was found to occupy 360cm³. Calculate the temperature at which the same mass of gas will occupy twice the volume at a pressure of 1000mmHg.

(2mks)

4. a) In the equation below, identify the reagent that acts as a base. (1mk)



b) Give a reason for your answer in (a) above (1mk)

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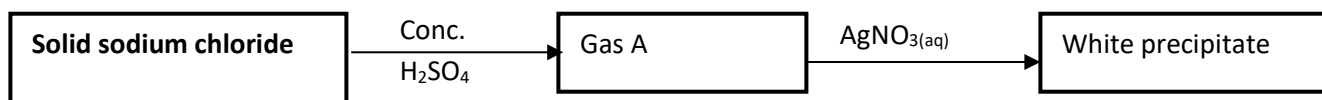
5. a) When left in the open air, anhydrous calcium chloride increases in mass. Explain (1mk)

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b) What name is given to the process in a above? (1mk)

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6. Study the chart below and answer the questions that follow.



a) Identify

i) Gas A (1mk)

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ii) White precipitate. (1mk)

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b) Write an ionic equation for the formation of white precipitate. (1mk)

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7. A student was supplied with a colourless liquid suspected to be water. Describe a chemical test that would be carried out to show that the liquid was water. (1mk)

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8. In an experiment to determine solubility of sodium chloride, 13.2g of saturated sodium chloride solution at 18°C was evaporated to dryness. 3.6g of the salt was left after complete evaporation of water. Determine the solubility of sodium chloride at 18°C. (3mks)

9. a) State Graham's law of diffusion. (1mk)

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A volume of 120cm³ of nitrogen gas diffused through a membrane in 40 seconds, how long will 240cm³ of carbon (IV) Oxide take to diffuse through the membrane under the same conditions (2mks)

10. A student was carrying out an experiment using Barium sulphate. The salt accidentally got mixed up with sodium sulphate. Describe how the student would get a dry sample of Barium sulphate. (3mks)

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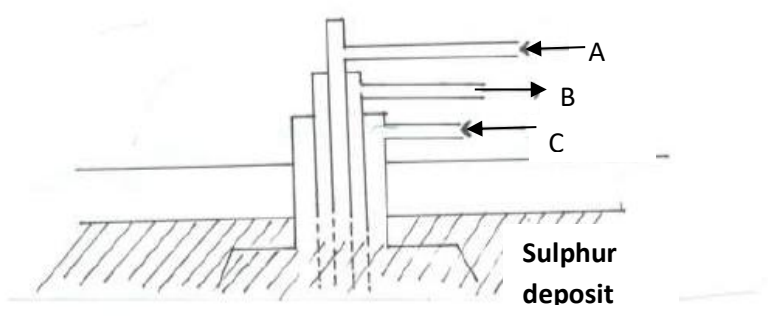
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11. The diagram below represents the Frasch process. Study it and answer the questions that follow



- a) Name;
- | | |
|---|--------|
| A | (½mk) |
| B | (½mk) |
| C | (½mk) |

b) Why is C pumped to the Sulphur deposit. (½ mk)

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c) Which property of sulphur enables it to be extracted by the method above. (1mk)

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12. An element A has two isotopes ⁵⁰A and ⁵²A. The relative atomic mass of A is 51.5

i) Determine the percentage abundance of each isotope. (2mks)

ii) Define the term isotopy (1mk)

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13. Study the table below and answer the questions that follow. The letters are not the actual chemical symbols of the elements.

Element	Atomic number	Atomic mass
W	20	40
X	9	19
Y	10	20
Z	17	35.5

i) Identify elements that belong to the same group and give a reason. (2mks)

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ii) Which element is a metal. (1mk)

.....

14. Study the information given in the table below and answer the questions that follow

Bond	C - H	Cl - Cl	C - Cl	H - Cl
Average bond enthalpy (KJmol ⁻¹)	414	244	326	431
Breaking of bond)				

a) Calculate the enthalpy change for the reaction (3mks)



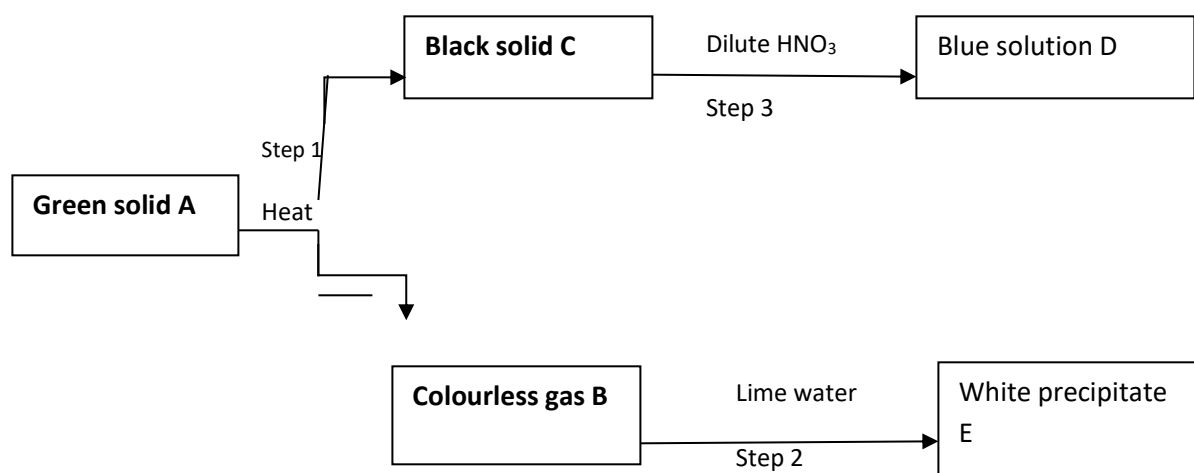
b) Is the reaction exothermic or endothermic?

Explain your answer.

(1mk)

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15. Study the flow chart below and answer the questions that follow



a) Write the chemical formulae of the following;

i) Green solid A

(1mk)

.....

ii) White precipitate E

(1mk)

.....

b) Write a chemical equation for the reaction taking place in the following steps.

i) Step 1

(½ mk)

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.....

ii) Step 3

(½ mk)

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.....

16. Soap solution was added to the three samples of water and the amount of soap required to form lather with 1 litre of each sample of water before and after boiling was recorded as shown below.

	I	II	III
Volume of soap before water is boiled	30	5	12
Volume of soap after boiling	30	5	5

a) Explain the change in the volume of soap solution used in experiment III. **(1mk)**

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b) Why was the volume of soap used in experiment II so low. **(1mk)**

17.a) State Avogadro’s law **(1mk)**

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b) 100cm³ of hydrogen was mixed with 300cm³ of chlorine and the mixture allowed to react.
Determine the maximum volume of hydrogen chloride gas that would form. **(2mks)**

18. The table below shows the tests that were carried out on solid R and the observations made

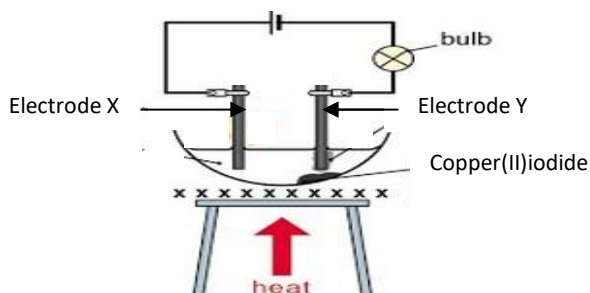
Test	Observations
i) Solid R was heated.	Solid R turned from white to yellow.
ii) Dilute hydrochloric acid was added to solid R.	Colourless solution was formed.
iii) To the colourless solution obtained in test II excess sodium hydroxide solution was added.	A white precipitate was formed which dissolved to form a colourless solution.

Write the formula of cation in;

a) Solid N **(1mk)**

b) Colourless solution formed in test III **(1mk)**

19. The diagram below is a set up of apparatus used during electrolysis of molten copper(II) iodide



i) List all ions present in the electrolyte. **(2mks)**

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ii) Write half equations for reactions in electrodes;

a) X (1mk)

b) Y

20. 2.4 g of magnesium were reacted with excess dilute hydrochloric acid at room temperature and pressure. Calculate the volume of hydrogen that was formed (Molar gas volume at R.T.P = 24dm^3 $\text{Mg} = 24$) (3mks)

21. Write the chemical formula of sodium sulphate. (1mk)

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22. Sulphuric (VI) acid is manufactured using the contact process.

a) State the catalyst used in the process. (1mk)

b) State the optimum conditions for the process. (1mk)

c) Explain how environmental pollution by the process is minimized. (1mk)

23. A student had 2 g of sodium hydroxide and z grammes of sulphuric (VI) acid. Which of the compound contain more of hydrogen atoms. (3mks)

(H =1, S = 32, O = 16, Na =23)

24. State and explain the observations made when concentrated sulphuric (VI) acid is added to glucose. **(2mks)**

25. Name an ion which must be present in acidic solution. **(1mk)**

26. Dry blue litmus paper was put into a gas jar of dry hydrogen chloride gas. State and explain the observations made. **(2mks)**

27. 250cm³ of water was added to 300cm³ of 2M sulphuric vi acid. determine the new concentration of the solution **(2mks)**

28. Liquid P and Q mix forming a solution and have different boiling points.

i) Name a suitable method of separation that would be used to separate the two liquids. **(1mk)**

ii) What property makes it possible to separate the two liquids P and Q. **(1mk)**

29. Describe a chemical test for chlorine. **(2mks)**

30. Describe how zinc sulphate crystals can be prepared. **(2mks)**

31. Use the information in the table to answer questions that follow. (The letters are not the actual chemical symbols of the element)

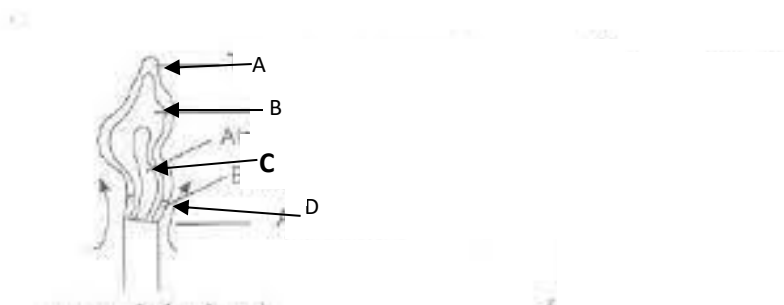
Element	Atomic radius (nm)	Ionic radius (nm)
M	0.158	0.097
N	0.202	0.132
L	0.133	0.061

a) Do these elements belong to a metallic or a non – metallic group? Give a reason.(2mks)

b) Which element is the most reactive? Explain.

(1mk)

32. Study the diagram below and answer the questions that follow



a) Name the flame above

(1mk)

b) Name parts A,B,C and D of the flame

(2mks)

A

B

C

D