

Candidates Name.....Index No.....

SCHOOL.....Signature.....

545/2  
CHEMISTRY  
PAPER 2  
JULY/AUGUST, 2022  
2 HOURS.

**KANUNGU DISTRICT JOINT MOCK EXAMINATIONS**  
**UGANDA CERTIFICATE OF EDUCATION**  
**CHEMISTRY**  
**PAPER 2**  
**2 HOURS.**

**INSTRUCTIONS TO CANDIDATES.**

Section A consists of 10 structured questions. Answer all questions in this Section.

Answers to these questions MUST be written in the spaces provided.

Section B consists of 4-semi structured questions.

Answer any two questions from this section.

Answers to the questions must be written in the answer booklet (s) provided.

In both sections all working must be clearly shown.

1mole of a gas occupies 22.4l at s.t.p

[C=12, H=1, S=32, Fe=56, O=16]

FOR EXAMINERS USE ONLY														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total

## SECTION A

Answer all questions in this section

- 1(a). Explain why solid particles are always vibrating in their positions under room temperature (1½ mks)

(1 ½ mks)

- (b). Explain what would happen to the solid particles if the temperatures were increased

(1 1/2 mks)

- (c). How are the particles in solid state different from those in liquid state. (2 marks)

(2 marks)

- 2(a). An atom of element Q has 12 neutrons and mass number 23. Write the formula of the Oxide of Q. (1 mark)

(1 mark)

(b). The Oxide of Q was dissolved in water and the aqueous solution tested with litmus solution.

(i). State what was observed. (0½ marks)

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(iii). Write equation for the reaction between the Oxide of Q and water. (1½ marks)

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(c). A piece of Q was ignited and lowered into gas jar containing chlorine.

(i). State why was observed. (½ marks)

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(ii). Write equation for the reaction that took place. (1½ marks)

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3. Oxygen gas can be best prepared in the laboratory by decomposition of hydrogen peroxide using a catalyst. (0½ marks)

(a). (i). Name the catalyst used.

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(ii). Write equation for the reaction. (1½ marks)

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(b). Copper metal was burnt in excess air (01 marks)

(i). State what was observed.

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(ii). Write equation for the reaction. (1½ marks)

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(c). The product in (b) was dissolved in warm sulphuric acid, state what was observed.

(01 marks)

4). A hydrated salt P consists of 20.2% iron, 11.5% Sulphur, 23% oxygen and 45.3% water of crystallization.

(a). Calculate the empirical formula of P

[Fe = 56, S = 32, O = 16, H = 1]

(2½ marks).

(b). Deduce the Molecular formula of P.

Relative formula mass of P = 278.

(1½ marks)

(c). Write equation for the reaction between a solution of P and Chlorine

(1½ marks)



5). (a). (i). Name the chemical substance that is used to prepare Carbondioxide gas in the laboratory with dilute hydrochloric acid. (0½ marks)

(ii). Write an Ionic equation for the reaction. (1½ marks)

(b). Calculate the volume of carbondioxide that would be obtained at S.t.p by dissolving 15g of calcium carbonate in dilute hydrochloric acid. (02 marks)

6). (a). Name the reagent used to differentiate between copper (II) ions and zinc (II) ions. (½ marks)

(b). (i). State what is observed when the reagent is used on the two cations. (03 marks).

7. Ethene can be prepared from Ethanol.

(i). Name the type of reaction for the preparation of ethene from Ethanol. (½ marks)

(ii). State the conditions for the reaction.

(1 marks)

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(iii). Write an equation for the reaction.

(1½ marks)

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b(i). Name the reagent used to differentiate between ethene and Ethane.

(½ marks)

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(ii). State what is observed when the reagent is used.

(01 marks)

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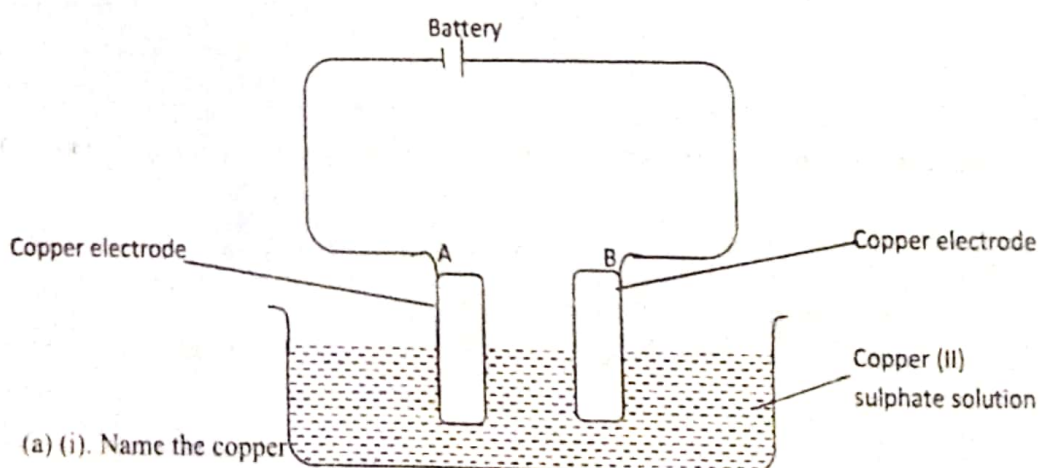
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8. Copper (II) sulphate solution was electrolyzed using copper electrodes as shown below.



(a) (i). Name the copper

A..... (½ mark)

B..... (0½ marks)

(ii). Name the ions present in the electrolyte.

(02 marks)

(b). State what is observed at

(i). Electrode A.

(0½ mark)

(ii). Electrode B.

(0½ mark)

(c). Write an equation for the reaction that takes place on each electrode;

(i). Electrode A.

(01½ marks)

(ii). Electrode B.

(1½ marks)

9. Iron can be extracted from one of it's ores Haematite.

(01 mark)

a(i). Define an ore.

(ii). Write the chemical formula of Haematite ore.

(0½ mark)

b). In the extraction of iron, iron ore Haematite coke and limestone are fed into a blast-furnance and hot air is blown into the mixture.

(i). Why is lime stone added to the mixture?

(01 mark)

(ii). Write equations for the reactions that lead to the formation of iron.

(02 marks)

10. (a). What do you understand by Enthalpy of combustion?

(01 marks)

(b). When 0.382g of Ethanol in a specimen bottle were burnt completely heat produced made the temperature of water in a thin- walled tin can rise from 17.7°C to 41.2°C. Mass of water in the tin can is 100g; the specific heat capacity of water is  $4.2\text{Jg}^{-1}\text{C}^{-1}$   
Calculate the heat of combustion of ethanol.

(3½ marks)



## SECTION B

Answer two questions from this section

11. (a). (i). Draw a labelled diagram of the setup of apparatus that can be used to prepare a dry sample of ammonia in the laboratory. (03½ marks)
- (ii). Write equation for the formation of ammonia. (1½ marks)
- b). (i). Name the process by which ammonia is manufactured on large scale. (½ marks)
- (ii). State the conditions for the reaction for manufacture of Ammonia gas (½ mark)
- (iii). Write the equation for it's manufacture. (1½ marks)
- (c). (i). State what is observed when concentrated nitric acid is added into a boiling tube containing copper turnings. (1½ marks)
- (ii). Write an equation for the reaction (1½ marks).
- (d). (i). State what is observed when ammonia solution is heated with copper (II) Oxide. (1 mark)
- (ii). Write an equation y the reaction. (1½ marks)
12. (a). (i). Name the acid used to prepare chlorine gas in the laboratory with potassium manganate (VII). (½ mark)
- (ii). Write an equation for the reaction. (1½ mark)
- (b). State the conditions under which Iron can react with hydrochloric acid and write equation for the reaction. (2½ marks)
- (c). Draw a fully levelled diagram for the setup of apparatus which can be used to prepare anhydrous iron (III) chloride in the laboratory. (4 marks)
- (d). During the manufacture of chlorine commercially graphite anode and Mercury cathode electrodes are used.
- (i). Name the process by which chlorine is produced commercially (½ mark)
- (ii). Write the equations at the cathode and then the anode. (3 marks)
- (iii). Name the other products produced. (1 mark)
- (e). (i). Write an equation for the reaction between magnesium bromide solution and chlorine. (1½ marks)
- (ii). Name the type of reaction above in e(i). (½ mark)
13. (a). Name:
- (i) The chemical methods used to prepare copper (II) sulphate crystals in a laboratory (½ mk)
- (ii) The chemical substances used to prepare copper(II) sulphate crystals in a laboratory (1mk)
- (b). Describe with an equation how you can prepare copper(II) sulphate crystals in the laboratory using the chemicals named in a(ii) above (5 ½ mks)
- (c). (i). Describe how you can prepare sulphurdioxide gas in laboratory (No diagram of apparatus is required). (3½ marks)
- (ii). Describe the bleaching action of sulphurdioxide. (2½ marks)

- (c). State any four uses of sulphuric acid. (2 marks)
14. (a)(i). What do you understand by rate of a chemical reaction? (1 mark)
- (ii). State the factors that affect the rate of a chemical reaction. (02 marks)
- (b). Describe an experiment that you would use to determine the rate of a reaction between magnesium metal and Hydrochloric acid in the laboratory. (4½ marks)
- (c). During an experiment for determination of the rate of reaction between magnesium metal and dilute Hydrochloric acid the results obtained were recorded as shown below

Time (s)	0	10	20	30	50	60	70	80
Volume (cm <sup>3</sup> )	0	18	30	40	53	57	58	58

- (i). Plot a graph of the volume of the gas produced against time in seconds. (6 marks)
- (ii). Determine the rate of reaction from the graph.

**END**