Uganda certificate of education

RESOURCEFULMOCK EXAMS 2017

CHEMISTRY

Paper 2

Name ……………………………………………………………………….

Index number …………………………… **sign** …………………………

INSTRUCTIONS:

*This paper consists of **two** sections **A** and **B;** Section **A** consists of ten structured questions, attempt **all** questions from this section in the spaces provided on the question paper. Section **B** consists of four semi-structured questions. Attempt any **two** questions from this section on the answer sheets provided*

(H=1; O=16 S=32, Cu=64; 1 mole of gas occupies 22400cm^3 at s.t.p)

SECTION A

Attempt all questions from this section

1. When 5.0g of copper sulphate crystals were strongly heated 3.2g of the anhydrous salt remained;
   (a) State what is observed when crystals of copper (II) sulphate are heated. (1mk)
      ………
      ……….
   (b) Calculate the formula of the hydrated salt
      ………
      ………
      ………
      ………
      ………
      ………

      ……
      ………..

2. Oxygen is usually obtained in the laboratory by the decomposition of potassium chlorate;
   (a) State the conditions under which potassium chlorate decomposes to form oxygen

   ………

   ……(1mk)

   (b) (i) Write equation for the decomposition of potassium chlorate($1\frac{1}{2} mks$)

   ………

   ……..

   (ii) State what is observed when burning sulphur is lowered in a gas jar of chlorine. (1mk)

   ………

   ………

   (c) Write equation for the reaction that occur when water is added to the product formed when sulphur burns in oxygen($1\frac{1}{2}mks$)

   ………

   ………

3. The table below show some of the properties of two elements M and X and their compound MX_2;

substance	Melting point/^oC	Electrical conductivity of solid	Electrical conductivity of liquid
M	650	good	good
X	-101	none	none
MX_2	782	none	good

(a) Suggest the type of bonding in;($1\frac{1}{2}mks$)

   (i)   Element M; ……………………………………………………………………..
   (ii) Element X; ………………………………………………………………………
   (iii) Compound MX_2 …………………………………………………………..

(b) Identify the particles responsible for electrical conductivity in;

   (i)   Solid M

   ……..

   (ii) Liquid MX_2

   ……………………………………………………………………………………………………… (2mks)

(c) Explain why the compound MX_2 does not conduct electricity in the solid state but does so in the liquid state, ($1\frac{1}{2}$mks)

4. Write an equation for the reaction that occurs when each of the following substances is strongly heated;

(a) Sodium nitrate   ($1\frac{1}{2}$mks)

………

………

(b) Copper (II) nitrate   (2mks))

………

………

(c) Silver nitrate   ($1\frac{1}{2}$mks)

………

…….

5. Sulphur dioxide is usually prepared by action of dilute nitric acid on sodium sulphite

(a) Write an ionic equation leading to the formation of sulphur dioxide from sodium sulphite and dilute nitric acid.($1\frac{1}{2}$mks)

………

……..

(b) State what is observed when sulphur dioxide is passed through an aqueous solution of;

(i)   Acidified potassium dichromate (1mk)

……

……

(ii)   Hydrogen sulphide   (1mk)

……

……

(c) State two industrial uses of sulphur dioxide(2mks)

(i)………

……

(ii)

……

……

6. Distinguish between a thermosetting plastic and a thermo-softening plastic   (2mks)

……….

……

……

(a) The figure below shows a plastic;

$(-CH_2CH\text{-}CH_2CH\text{-})$
$\qquad CH_3 \quad CH_3$
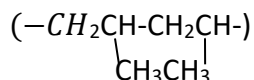
    (i)   Name the process through which the plastic is formed($^1/_2$mk)

....

    (ii)   Write the name and formula of the compound from which plastic was made;

....

....

....

(1mk)

    (iii) State two uses of the plastic above   (2mks)

....

....

....

7. (a) Write equation to show how each of the following salts can be prepared;

    (i)   Iron (II) sulphate ($1^1/_2$mks)

....

....

    (ii)   Lead (II) sulphate ($1^1/_2$mks)

....

....

(b) Briefly describe how you can show that an aqueous solution of iron (II) sulphate contains sulphate ions. (2mks)

....

....

....

....

....

....

8. The table below shows the volumes of liquid soap required by 100cm^3 three different samples of water;

Sample of water	Volume of soap needed to form lather	
	Before boiling	after boiling
A	15	15
B	5	5
C	20	3

(a) Identify which sample of water is;$(1\frac{1}{2}$mks)

   (i) Soft; ………

   (ii) Temporarily hard; ……………………………………………………………………………………..

   (iii) Permanently hard; ………………………………………………………………………………………

   (a) Name the substance which causes;

   (i) Temporary hardness of water $(\frac{1}{2}$mk)

   ………

   (ii) Permanent hardness of water; $(\frac{1}{2}$mk)

   ……

(b) Write equation to show how boiling removes hardness of water $(1\frac{1}{2}$mk)

   ………

   ………

(c) State two disadvantages of hard water

   (i) ……

   ……

   (ii) ……

   ……

9. Zinc dust was strongly heated in a porcelain boat;

   (a) State what was observed (1mk)

   ………

   ………

   (b) Write equation for the reaction that occurs when zinc dust is heated $(1\frac{1}{2}$mks)

   ………

   ………

   (c) To the product formed when zinc was heated, was added dilute nitric acid; to this solution aqueous ammonia was added drop-wise until in excess;

   (i) Write equation for the reaction and the product formed when zinc dust is heated$(1\frac{1}{2}$mks);

………
……..

(ii)   State what is observed when ammonia solution is added until in excess to the product in (c)(i) above. (1mk)

……
………..

10. Name a pair of substances that can be separated using each of the following methods; (1mk each)

(a) Fractional distillation

……..

(b) Sublimation

……

(c) Filtration

……..

(d) Decantation

…………………………………………………………… is meant

……………………………………………………………..

(e) Fractional crystallization

……..

SECTION B

Attempt any two questions from this section

11. (a) (i) Whatis meant by the term 'rate of a chemical reaction'? (2mks)

   (ii)State the factors that affect the rate of a chemical reaction (2mks)

   (b)(i) Write an ionic equation for the reaction between magnesium Type equation here. and dilute hydrochloric acid($1^1/_2$mks)

    (ii) Sketch a graph to show how the volume of gas produced in the reaction between magnesium and hydrochloric acid varies with time (2mks)

© (i) Briefly describe from the graph how the rate of reaction can be determined.(2mks)

  (ii) On the same axes draw graphs to show how the volume of gas would vary with time if 1M hydrochloric acid and 2MM hydrochloric acid were separately reacted with the same mass of magnesium (1mk)

(iii)   Calculate the volume of hydrogen gas that would be formed if 20cm^3 of 2M hydrochloric acid completely reacted with magnesium(3mks)

(d) Explain how a decrease in the concentration of acid affects the rate of reaction between magnesium and hydrochloric acid(2mks)

12. (a) Draw a labeled diagram of the apparatus you would use to prepare dry ammonia gas in the laboratory. Write equation for the reaction leading to the formation of ammonia(5mks)

(b) ammonia was passed over hot copper (II) oxide

(i)   State what is observed.(1mk)

(ii)   Write equation for the reaction that occurs. ($1^1/_2$mks)

(c) One of the major uses of ammonia is the manufacture of nitric acid;

(i)   State the conditions under which nitric acid is obtained from ammonia. ($1^1/_2$mks)

(ii)   Write equations for the reactions leading to the formation of ammonia.(6mks)

13. (a) Define each of the following terms(1mk each)
(i)   Atomic number
(ii)   mass number

(b) Given the following atoms;

$^{23}_{11}P$. Q^{35}_{17}, R^{12}_6

(i)   determine the group and period to which each of the elements P,Q,, R belong ($1^1/_2$mks)

(ii)   identify which of the elements P, O and R is the most electronegative.(1mk)

(iii) using electronic diagrams describe how each of the elements P and R separately combine with Q (6mks)

(iv)   state ways in which the compound formed between P and Q would differ from that formed between R and Q. (4mks)

14. (a) What is meant by the term electrolysis (2mks)

(b) Sodium on a large scale is obtained by electrolysis

(i)   Name the raw material from which sodium is manufactured,(1mk)

(ii)   State the importance of calcium chloride in the manufacture of sodium.(2mks)

(iii) Identify the materials used for cathode and anode during manufacture of sodium (2mks)

(iv)   Write equations for the reactions that occur at the cathode and anode.(3mks)

(c) (i) With reason suggest an area in Uganda where a factory extracting sodiumwould be set up (2mks)

Would be set up (2mks)

(iii)   Explain how a sodium extraction plant would affect the environment(3mks)

END