**ELDORET DIOCESE EXAM 2021**

**NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ INDEX NO \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**233/1**

**CHEMISTRY**

**PAPER 1**

**TIME 2HRS**

1. Element K has atomic number 20 while element M has atomic number 8.
2. Write the electron configuration of K and M

K \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

M \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

1. Write the symbol of the most stable ion of K and M

K \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1/2 mk)

M \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1/2mk)

1. Molten lead (ii) iodide is electrolyzed using inert electrodes. Write the half equation of the reactions that occur at the anode and cathode.
2. Anode \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)
3. Cathode \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)

b) Explain why the conductivity of metals decrease with increase in temperature

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1. Some sodium chloride was found to be contaminated with copper (ii) oxide. Describe how a sample of dry sodium chloride can be obtained from the mixline

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1. Hot platinum wire was lowered into a flask containing concentrated ammonia solution as shown below

Conc ammonia solution

Hot platinum wire

Glass rod

State and explain the observations made (3mks)

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1. a) What is a dative boud? (1mk)

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b) Draw a dot (.) and cross (x) diagram to show bouding in carbon (ii) oxide (2mks)

1. Air was passed through several reagents as shown in the flow chart diagram

Excess heated magnesium powder

Excess heated copper turnings

Concentrated KOH solution

Air

1. What is the purpose of concentrated potassium hydroxide solution? (1mk)

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1. Write an equation for the reaction which takes place in the chamber with magnesium powder (1mk)

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1. Name one gas which escapes from the chamber containing magnesium powder (1mk)

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1. Name the following substances
2. CH­­2­CH CH2CH3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)
3. CH3CHCHCH2CH3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1mk)
4. State the observation made when compound in (a) above was passed through acidified potassium (vii) manganite (1mk)

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1. The diagram below shows a wooden splint that was placed horizontally across the middle part of a non-luminous flame.

Charred black

1. Explain the observation made (2mks)

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1. Explain why non-luminous flame is preferred for heating than luminous flame (1mk)

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1. Explain giving reasons why?
2. Sulphuric(vi) acide is not used with marble in the preparation of carbon(iv) oxide (2mks)

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1. Water cannot be used to extinguish oil fire

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1. 15cm3 of a solution containg 2.88g/dm3 of an alkali XOH completely reacts with 20.0cm3 of 0.045m sulphuric(vi) acid. Calculate the molarity and relative atomic mass of x present in the alkali

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1. An hydrocarbon Q was found to decolourise potassium manganate(vii)solution. When two moles of Q were burnt completely six moles of carbon(iv)oxide and six moles of water were formed.
2. Write the structural formula of Q (2mks)

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1. Name the homologous series to which Q belongs

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1. The diagram below represents an electrochemical cell

Cell B

Cell A

Zinc

Copper

Copper (ii)sulphate

Zinc sulphate

i) On the diagram label the salt bridge (1mk)

ii) State two observations made in cell B (1mk)

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1. Write the overall ionic equation of the cell (1mk)

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1. During the extraction of copper and zinc from their ores, some of the processes include
2. Crushing
3. Mixing of the crushed ore with oil and water and bubbling air through it.
4. (i) Name the process (ii) above (1mk)

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(ii) What is the purpose of (ii) above

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1. Dry chlorine gas was passed through two pieces of coloured cotton cloth as shown

Wet cloth

Experiment I

Experiment II

Dry chlorine

Dry chlorine

1. State what is observed in each experiment (1mk)

Experiment I

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Experiment II

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1. Explain your observation using an equation (1mk)

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1. a) what is meant by solubility? (1mk)

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b) In an experiment to determine the solubility of solid Y in water at 30oC the following results were obtained.

Mass of evaporating dish = 26.2g

Mass of evaporating dish + saturated solution = 42.4g

Mass of evaporating dish + dry solid y = 30.4g

Using the information, determine the solubility of solid Y at 30oc in grams per 100g of water (2mks)

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1. the molar heat of formation of carbon(ii) oxide is -105kjmol-1, molar heat of combustion of carbon is -393 kjmol-1

by using an energy cycle diagram, determine the molar heat of combustion of carbon(ii)oxide (3mks)

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1. The diagram below was used to study the effect of heat on copper(ii)sulphate crystals

Ice cold water

Liquid M

Boiling tube

Heat

Copper(ii)sulphate

1. Name liquid M (1mk)

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1. State and explain the precaution that should be made before stopping heating (2mks)

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1. Deuterium 21D and tritium 31T are two isotopers of hydrogen. They react to form element Y and neutron particles according to the equation below.

21D + 31T abY + 10n

1. Find the value of a and b (2mks)

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1. What name is given to the type of reaction undergone by the isotope of hydrogen (1mk)

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1. A gas occupies 4dm3 at -230c and 152mmHg. At what pressure will its volume be halved, if the temperature then is 2270c? (2mks)

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1. Ammonium nitrate was gently heated and the products collected as shown in the diagram

Ammonium nitrate

Gas G

Water

Colourless liquid

Ice cold water

1. Identify
2. Colourless liquid H (1mk)

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1. Gas G (1mk)
2. Describe one chemical test that can be used to identify gas G

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1. The diagram below shows the acidic and basic oxides fit into the general family of oxide

Basic oxide

Acidic oxide

1. State the type of oxide that would be placed in the shaded area (1mk)

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1. Name an oxide that would be placed in the shaded area (1mk)

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1. A dynamic equilibrium between dichromate and chromate ions is established as shown in the equation below.

Cr2O72-(aq) + ZOH-(aq) 2Cro2-4 + H2O (l)

Orange Yellow

1. What is meant by dynamic equilibrium? (1mk)

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1. State and explain the observation made if a dilute hydrochloric acid is added to the equilibrium mixture (2mks)

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1. An experiment showed that the composition of a compound to be 5838% Barium, 13.72% Sulphur and 27.47% oxygen. Calculate the empirical formula of the compound (Ba = 137; S=32, O=16) (3mks)

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1. In an experiment to study diffusion of gases, the following set up was used

Cotton wool soaked in con. Hcl

Cotton wool soaked in conc. NH3(aq)

1. State and explain observations made in the experiment (2mks)

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1. Write an equation for the reaction that occurs in the experiment (1mks)

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1. The figure below is an energy level diagram for the reaction 2Z (g) + 2B(g) = 2AB(g)

Reaction progress

Energy (kj)

2AB(g)

2Z (g) + B(g)

Explain the effect of yield AB by

1. Increase in pressure (1 ½ mk)

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1. Decrease in temperaline (1 ½ mk)

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1. Study the following changes that took place when the following substances are exposed to air.
2. NaOH(s) I NaOH(aq)
3. N2CO3.IOH2O(s) II Na2CO3(s) + IOH2O(l)
4. CuSO4(s) + 5H2O(l) III CuSO4.5H2O(s)

Name the process (3mks)

I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

II \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

III \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A white solid K was heated. It produced a brown gas A and another gas B which relights a glowing splint. The residue left was yellow when hot and white when cold.
2. Identify gases A and B (2mks)

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Write an equation for the decomposition of solid K (1mk)

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1. Bronze is an alloy of copper and another metal. Identify the other metal.

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