Name --------------------------------------------- class ----------------------------am no. ------------------

Teacher -------------------------------------------------------

233/1

CHEMISTRY

Paper 1

Time: 2 hours

**Kenya certificate of secondary education (K.C.S.E)**

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided above
2. Write the school, date and sign in the spaces provided above.
3. All workings must be clearly shown.
4. Answer all the questions in the spaces provided.
5. Mathematical tables and electronic calculators may be used.

For examiners’ use only

|  |  |  |
| --- | --- | --- |
| Question | Maximum score | Candidates score |
| 1-29 | 80 |  |

1. Study the set below and answer the questions the flow.



1. Name gas p ------------------------------------------------------------------------ (1 mark)
2. Write a balanced equation which takes place in the combustion tube. (1 mark)

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1. State and explain what would happen if magnesium would be replaced with copper. (1 mark)

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1. Use the bond energies given below fro questions that follow.

Bond bond energy (kjmol -1)

H-H 432

C = C 610

C-C 346

C- H 413

Determine the enthalpy change for the conversation of bul-1-ene to butane by hydrogen. (3 marks)

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1. The structure below represents two cleansing agents, A and B

A

R – COO – Na+

B

R OSO3Na+

Which cleansing agent would be suitable for washing in water with dissolved magnesium sulphate. Give a reason. (2 marks)

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1. An aqueous solution of ammonia was added drop wise to a solution of copper (II) Sulphate until in excess
2. State the observation made when
3. A few drops of aqueous ammonia were added. (1 mark)

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1. Excess aqueous ammonia was added. (1 mark)

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1. Write the formula and give the name of the complex ion responsible for the observation made in (a) (ii) above. (1 mark)

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1. Study the following scheme and answer the questions that follow.

214 210 210

Bi I Ti II Pb

83 81 82.



1. Identify the particles emitted at (1 mark)
2. ------------------------------------------------------------------------------------
3. -------------------------------------------------------------------------------------
4. An isotope G has a half life of 2.5 hours. What percentage of a given mass will be after 10 hours? (2 marks)

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1. The table below gives information about the ions W+ and y2-

Ion W+ Y2-

Electrons arrangements 2.8 2.8.8

Number of neutrons 12 16

1. How many protons are there in the nucleus of
2. Elements W? ----------------------------------------------------------------------- (1 mark)
3. Elements Y? ------------------------------------------------------------------------ (1 mark)
4. Determine the relative formula mass o the compound formed between W and Y. (1 mark)

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1. State two conditions under which the compound would conduct electricity. (1 marks)

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1. Study the flow diagram below and answer the questions that follow.

MnO2

HCL (aq)

Gas L

Cold dilute NaOH

NaCL (aq)

Salt M

1. Name gas L ----------------------------------------------------------------------- (1 mark)
2. Write a balanced equation for the reaction between hydrochloric acid and manganese (IV) oxide. (1 mark)

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1. .
2. .
3. .
4. .
5. .
6. A certain mass of carbon (IV) oxide gas occupied 200CM3 AT 25° C and 750 mmHg pressures. Calculate the volume occupied by the same mass of gas if pressure is lowered to 300 mmHg and temperature raised to 30° C. (2 marks)

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1. A) Zinc metal displaces oxygen from lead (II) oxide however it is unable to displace oxygen from magnesium oxide. Explain (1 mark)

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B) Write a chemical equation to show the reaction between Irion and lead (II) oxide. (1 mark)

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1. The following data gives the PH vales of some solution A, B and C..

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| --- | --- |
| Solution | PH |
| A | 13.0 |
| B | 6.9 |
| C | 2.0 |

1. Which solution would produce carbon (IV) oxide gas when reacted with copper (II) carbonate? (1 mark)

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1. What colour change would occur in solution A on addition of three drops of phenolphthalein indicator. (1 mark)

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1. What volume of 0.2 M hydrochrolic acid would react completely with 0.005 moles of pure calcium carbonate? (2 marks)

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1. A) when an electric current was passed through molten substance P and Q in different containers the observations below were made:

Molten P - Conduct electricity and is not decomposed.

Molten Q – Conduct electric current and a gas is formed at one of the electrodes. Suggest the type of bonding present in

1. Substance P ----------------------------------------------- (1 mark)
2. Substance Q ------------------------------------------------- (1 mark)

B) The cell convention for n electrochemical cell is shown below.

Zn (s) / Zn2+ (aq)// Pb 2+(aq) / Pb (s)

1. Name one substance that can be used as electrolyte in the above cell. (1 mark)

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1. Which one of the electrodes is the anode? (1 mark)

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1. Name and give the formula of :
2. The chief ore from which Zinc is extracted. (1 mark)

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1. The main impunity in the ore (1 mark)

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1. The ore is concentrated by froth floatation. What is froth floatation?(1 mark)

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1. The set up below can be used to dry and collect ammonia gas. Use it to answer the questions that follow.



1. The dry red – litmus paper remained unchanged. Explain. (1 mark)

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1. State the change necessary for the red litmus paper to change its color (1 mark)

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1. Name the method used to collect ammonia gas. (1 mark)

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1. Describe how a sample of lead (II) chloride can be prepared using the following reagents. Dilute (V) acid, dilute hyrodchloric acid and lead carbonate. (3 marks)

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1. Magnesium was connected to an underground pipe made of iron as shown in the diagram below.



Below why it is necessary to carry out the process shown above. (2 marks)

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1. An atom of hydrogen has two ions. Write two equations to show how a neutral atom of hydrogen can from the two ions. (2 marks)

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1. Name the following compounds. (1 marks)



1. CHCCH(CH3)CH3 (1 mark)
2. Name the process which takes place when. (1 mark)

Fe 3+ (aq) changes to Fe2+ (aq)

1. Concentrated sulpahte (IV) acid is added to sugar which leads to formation of a black solid. (1 mark)
2. Describe physical tests you can use to distinguish between methanol and hexanol. (2 marks)

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1. 50 cm3 of hydrchrolic acid solution containing 3.65 g/cm3 of acid reacted with 25cm3 sodium carbonate solutions. Calculate the concentration and sodium carbonate in moles per liter. (NA = 23, Cl = 3535, O = 16.0, C= 12.0, H = 1.0

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1. A student wanted t determines the solubility of potassium nitrate at a certain temperature.

He obtained the following results.

Mass of evaporating dish + saturated solution = 34.10 g

Mass of evaporating dish + salt = 17.72

Mass of evaporating dish = 17.00g

Calculate the solubility of potassium nitrate from the results above. (2 marks)

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1. Use the scheme below to answer the questions that follow.

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Solid H

Heat

Carbon (IV) oxide

Solid J

H2O

Ca(OH)2 (aq)

1. Identify the solid H and J

H ----------------------------------------------------------- (1 mark)

J ----------------------------------------------------------- (1 mark)

1. State one commercial use of solid J (1 mark)

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1. A) the equation represents a redox reaction

2 FeCl2 (aq) + Cl2 (g) 2 Fel3 (aq)

Identify the reducing agent. Give a reason (2 marks)

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1. What is the oxidation number of chlorine in CLO-4? (1 mark)
2. The data below was recorded when metal M was completely burnt in air. M is not the actual symbol of the metal. (M = 56, O= 16)

Mass of empty crucible and lid = 10.240 g

Mass of crucible, lid and metal M = 10.352 G

Mass of crucible, lid and, metal oxide = 10.400G

1. Determine the mass of
2. Metal M (1 mark)

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1. Oxygen (1 mark)

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1. Determine the empirical formular of the metal oxide (1 mark)

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