HOME PACKAGE

FOR ORDINARY LEVEL CHEMISTRY

FORM THREE

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PROBLEM 01

Copper hydroxide is blue and, on heating it decomposes to form a black solid. Iron 9iii) hydroxide is reddish-brown and on heating, forms a reddish brown compound. Explain the changes and write two chemical equations for them?

PROBLEM 02

Sodium hydrogen carbonate is used to control acid indigestion and lime (calcium oxide) to control acidity in soil. Explain the chemistry underlying these two uses. Write simple formulae and equations in your answer

PROBLEM 03

Describe the usual test for oxygen. Why does air, which contains oxygen, not give this Result?

PROBLEM 04

(a) Name the products formed, and state their color, when the following burn in oxygen

       a) Sodium

       b) Copper

       c) Iron

       d) Sulphur

b) State the flame colour produced by each at home when burns in oxygen from question (a) above

PROBLEM 05

a) Explain briefly, how do particles in ice differ from those in water?

b) How do the molecules in water differ from those in steam? Use the kinetic theory to explain why a little water evaporates at ordinary temperatures?

c) Name two crystals that contain water of crystallization and two crystals that do not

PROBLEM 06

a) In what ways does the action of heat on sodium carbonate, hydroxide and nitrate, differ

from the action of heat on the three copper compounds?

b) Lead (II) chloride is insoluble in cold water but fairly in hot water. Outline the preparation

of lead (II) chloride crystals from lead (II) nitrate.

c) Outline the preparation of zinc sulphate from zinc. Why is your method not suitable for?

preparing copper sulphate from copper?

PROBLEM 07

a) In this twenty first century there is no natural water which 100% pure. Briefly explain the

Validity of this statement.

b) Why doesn't the presence of sodium ions in water affect the formation of lather from soap and

water?

c) With equation explain lime scale formed.

PROBLEM 08

1.16g Magnesium was allowed to react with excess dilute Sulphoric acid. What volume of

hydrogen measured at s.t.p was liberated?

PROBLEM 09

180g of zinc metal was dropped into a beaker of hydrochloric acid. After the reaction stopped, 35

grams of reacted zinc remained. Calculate; -

i) Mass or HCl that reacted.

ii) Volume of H_2 (g) produced.

PROBLEM 10

An element x has a relative atomic mass of 88. When a current of 0.5 ampere was passed through

the fused chloride of x for 32 minutes and 10 seconds, 0.44g of x was deposited at cathode.

    (i)   Calculate the number of faradays needed to liberate 1mol of x

    (ii)   Write the formula for x ions

    (iii)   Write the formula for the hydroxide of x

PROBLEM 11

 How many moles of electrons are required to produce by electrolysis?

(i) 27 grams of aluminum

(ii) 8 grams of oxygen

PROBLEM 12

(a) With the aid of chemical equation explain how you can obtain pure copper from blister copper (Diagram is necessary)

(b) Extraction of metal termed as reduction. Explain

PROBLEM 13

Briefly explain three applications of electrolysis.

PROBLEM 14

What mass of copper will be deposited from a solution of copper (II) sulphate when a current of 7.5A is passed through for 1 minute and 40 seconds?
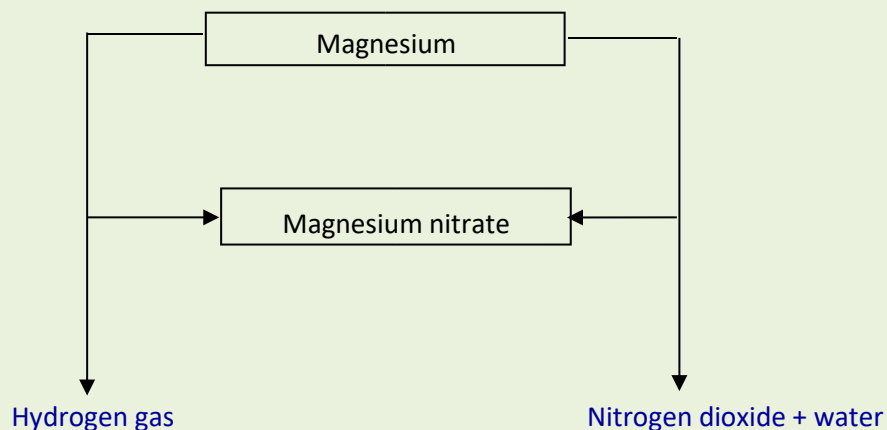
PROBLEM 15

In one titration experiment performed by form three students, $25cm^3$ of hydrated sodium carbonate $(Na_2CO_3.XH_2O)$ were titrated against $20cm^3$ of 0.25M hydrochloric acid. The solution of sodium carbonate was made by dissolving 7.15g of the compound in $250cm^3$ of distilled water. Use the above data to calculate the following

a) Write down a balanced equation to represent the acid base reaction

b) i) Find the molarity of the hydrated sodium carbonate

ii) Calculate the value of X in the hydrated sodium carbonate

PROBLRM 16

The scheme diagram below shows the precipitation of magnesium nitrate. Study it, then answer the questions that follow

a) Identify substance P and Q

b)   Write the equation for the reaction between magnesium and substance Q and P.

PROBLEM 17

Baking powder contains sodium hydrogen carbonate mixed with an acid. When water is added, the baking powder releases carbon dioxide

a) How could you test the gas to show that it is carbon dioxide? (Equation is necessary)
b) Write a balanced chemical equation for the reaction of sodium hydrogen carbonate with sulphuric acid

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PROBLEM 18

Mr. Msaki added few drops of a solution of potassium iodine to a solution of lead nitrate

a) State the observation made

b) Write an ionic equation

c) Write balanced chemical equation for the reaction

PROBLEM 19

A solution of sodium hydroxide is added to a sodium solution of hydrochloric acid

a) Given that both solutions are at room temperature (180^0C) What type of reaction takes place if the final steady temperature of the reaction mixture is 36^0C?

b) Draw an energy level diagram for the reaction

c) Draw an energy profile for the reaction

PROBLEM 20

The equation below shows a reaction between potassium and iodine

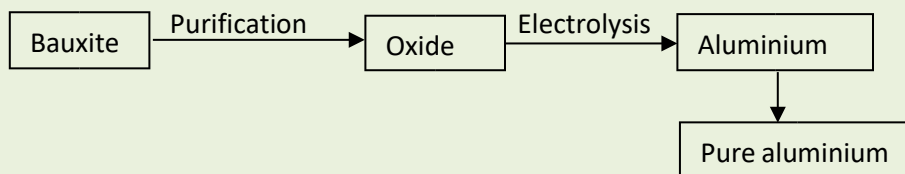` $2K(s) + I_2(s) \longrightarrow 2I(s)$
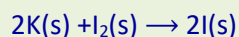
c)   Which substance is:

i)   The oxidizing agent?

ii)   The reducing agent?

d) Write the oxidation equation.

PROBLEM 21

The flow chart below shows the extraction of aluminum from bauxite.

Bauxite → (Purification) → Oxide → (Electrolysis) → Aluminium → Pure aluminium

a) In the purification process, the bauxite ore is heated to bright redness with sodium carbonate. Write an equation for the main reaction that take places

b) What is the electrolyte in the electrolysis of bauxite?

c) Draw a well-balanced diagram of the electrolytic cell used in the electrolysis of bauxite

d) Write the cathode and anode reaction reactions in the electrolysis of bauxite using the cell you have drawn in (c) above

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PROBLEM 22

a) Explain how can you obtain pure copper from blister copper (Diagram is necessary) with the aid of chemical equations

b) Extraction of metal termed as reduction process explain

PROBLEM 23

a) Briefly explain three applications of electrolysis

b) What mass of copper will be deposited from a solution of copper (II) sulphate when a current of

7.5A is passed through for 1 minute and 40 seconds?

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