**DARAJANI SECONDARY SCHOOL,**

**P.O. BOX 20-90129, NGWATA.**

**MID\_TERM 2, 2015\_ EXAMINATION**

**FORM 3**

**CHEMISTRY PAPER 1**

**233/1**

**TIME: 2HRS**

**NAME…………………………………………………………………………………………ADM. NO……………….. CLASS:…………….**

1. Nitrogen and oxygen are among the gases in the air. Nitrogen boils at -196oC and oxygen boils at -183oC. Explain how a pure nitrogen gas can be obtained from a mixture of nitrogen and oxygen. (3 marks)

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1. The spot in the diagram below represents a paper chromatogram for three brands of soda, suspected to contain unwanted food additives.

 x x x

M N P

The results showed the presence of unwanted food additives in N and P only. On the chromatogram:-

1. Circle the spots which show unwanted food additives. (1 mark)
2. Label the solvent front and the base line on the chromatogram. (2 marks)
3. Study the diagram below and answer the questions that follow.

Write a chemical equation of the reactions occurring at point A and B. (4 marks)

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1. State and explain what is observed when a lighted candle is covered with a jar full of carbon (IV) oxide. (2 marks)

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1. When anhydrous calcium chloride is expressed to the atmosphere it forms a solution.

H2O

CaCl2 CaCl2

aq

g

1. Name the process that takes place. (1 mark)

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1. State the use of the process displayed by anhydrous calcium chloride. (1 mark)

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1. (a) What are isotopes? (2 marks)

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(b) Lithium has two isotopes $\frac{7}{3}$Li and $\frac{6}{3}$Li. Determine the number of neutrons in $\frac{6}{3}$Li. (2 marks)

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(c) If the relative atomic mass of lithium is 6.94. Which of the two isotopes is the abundant? Give a reason. (2 marks)

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1. A student wanted to prepare carbon (IV) oxide. Part of the set up is as shown in the figure below.
2. Identify one mistake in the set-up. (1 mark)
3. Complete the set up to show how dry carbon (IV) oxide may be prepared and collected. (3 marks)
4. (a) Explain why the metals such as magnesium and aluminium are good conductors. (2 marks)

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(b) Give two reasons why aluminium is preferred to magnesium for making cooking pans. (2 marks)

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1. State and explain, using relevant equations the observation made when carbon (IV) oxide is bubbled through calcium hydroxide solution for a long time. (3 marks)

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1. State four differences between luminous and non-luminous flames. (4 marks)

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1. The diagram below shows the relationship between the physical state of matter. Study it and answer the questions that follow.

Solid

Liquid

Gas

S

R

U

T

W

V

1. Identify the processes:- (4 marks)

R \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

V \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

W \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

U \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (b) Name two substances which can undergo the process represented by S and T. (2 marks)

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1. Draw and name the apparatus you would use in the separation of a mixture of kerosene and water. (3 marks)
2. A crystal of potassium manganate (VII) was placed at the bottom of a trough of water. After 30 minutes, the water in the trough was coloured purple. Explain the observation. (3 marks)

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1. The table below gives the first ionization energies of the alkali metals.

|  |  |
| --- | --- |
| Element | 1st ionization energy Kj/mol |
| A | 494 |
| B | 418 |
| C | 519 |

1. Define the term ionization energy. (1 mark)

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1. Which of the three metals is the least reactive? Give a reason. (2 marks)

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1. Below is an illustration of one of the methods used to collect gases in the laboratory.
2. Name the method illustrated above. (1 mark)

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1. Give one major characteristics of gases collected by this method. (1 mark)

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1. A pure sample of iodine crystals can be separated from its mixture with sand by heating.
2. What is observed during heating? (1 mark)

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1. What property of iodine makes this separation possible? (2 marks)

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1. The set up below was used to investigate the effect of an electric current on molten lead (II) iodide.
2. Identify the cathode and anode. (2 marks)

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1. State what is observed at the:-
2. Cathode (2 marks)

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1. Anode (2 marks)

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1. Write equation for the reaction at the:-
2. Cathode (2 marks)

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1. Anode (2 marks)

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1. Oxygen can be prepared from hydrogen peroxide in the presence of a catalyst.
2. Name the catalyst used. (2 marks)

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1. Write an equation for the formation of oxygen gas. (2 marks)

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1. State the test for oxygen gas. (2 marks)

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1. 20cm3 of sodium carbonate solution was reacted completely with 25cm3 of a 0.8M hydrochloric acid according to the equation.

Na2CO3 + 2HCl NaCl + CO2 + H2O

(aq) (aq) (aq) (g) (l)

Calculate the concentration of sodium carbonate solution in grams per litre. (4 marks)

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1. Draw the structural formula and give the IUPAC names of the following.
2. CH3CH2CH3 (2 marks)
3. CH3(CH2)3CH3 (2 marks)
4. CH3CHBrCHBrCH(CH3)CH3 (2 marks)
5. CH3C(CH3)2CH3 (2 marks)