NAME: ……………………………………………………………..… ADM …………….

**JUJA GIRLS HIGH SCHOOL**

**TERM I OPENER EXAMINATIONS 2019**

**FORM FOUR**

***Kenya Certificate of Secondary Education (KCSE)***

***233/1/2***

***Paper 1/2***

***Chemistry (Theory)***

***January 2019***

***1 Hour 30min***

**Instructions**

* *Answer* ***all*** *the questions in the spaces provided.*
* ***All*** *working* ***must*** *be clearly shown.*
* *Silent non programmable electronic calculators may be used.*

**For Examiner’s Use Only**

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| --- | --- | --- |
| **Questions** | **Maximum Score** | **Student’s Score** |
| 1-7 | 50 |  |

1. Methane $CH\_{4}$, is an organic compound. It is the first member of an homologous series of **saturated hydrocarbons**.
2. What is meant by the term **hydrocarbon**?(1mk)

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1. What is meant by the term **saturated?**  (1mk)

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1. Name the homologous series to which methane is the first member.(1mk)

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1. Draw the structural formula of the second member of this homologous series.(1mk)

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1. Calcium sulphate can be prepared using a precipitation reaction between calcium chloride solution and dilute sulphuric acid.
2. Describe the steps that would be followed to produce a pure ,dry sample from the resulting mixture in this reaction. (3mks)

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1. Write a balanced chemical equation for the reaction.(1mk)

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1. If a 5.55g sample of calcium chloride ( molar mass 111) is dissolved in water to make a solution.
2. Calculate the amount, in moles in the sample of calcium chloride.(2mks)

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1. What amount, in moles, of sulphuric acid is needed to react completely with the calcium chloride solution. (1mk)

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1. Calculate the mass in grams of calcium sulphate formed.(S=32, Ca=40,O=16) (3mks)

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1. A sample of copper contains two isotopes.
2. What are isotopes? (1mk)

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1. Complete the table for these isotopes of copper. (2mks)

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| --- | --- | --- | --- | --- |
| Atomic number | Mass number | Number of protons | Number of neutrons | Percentage of each isotope in sample |
| 29 | 63 |  |  | 69 |
|  |  | 29 | 36 | 31 |

1. Use information in the table in (b) above to calculate the relative atomic mass of this sample of copper. Give your answer to one decimal place. (2mks)

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1. Why do the two isotopes of copper have the same chemical properties? (1mk)

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1. Copper carbonate, a compound of copper when heated produces copper (II) oxide as one of the products.
2. State the colour change observed.(1mk)

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1. Write a balanced equation for the reaction.(1mk)

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1. Write the formula of another oxide of copper.(1mk)

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1. If some dilute hydrochloric acid was added to the copper (II) oxide, write a balanced equation for the reaction that takes place. (1mk)

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1. The figure below represents set up that can be used to prepare and collect oxygen gas.

 

1. Name solid R (1mk)

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1. What is the role of solid R? (1mk)

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1. Write a word equation for the reaction that takes place. (1mk)

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1. Identify the method of gas collection employed. (1mk)

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1. Why is the method in (d) above suitable for collecting oxygen?. (1mk)

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1. Explain why it is important not to collect any gas for the first few seconds of the experiment. (1mk)

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1. State the chemical test for oxygen gas. (1mk)

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1. Name a solid which would produce oxygen gas when water is added to it.(1mk)

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1. Name any ***one*** solids which when heated produces oxygen gas as one of the products. (2mks)

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1. a) Define allotropy. (1mk)

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 b) Name ***two*** allotropes of sulphur. (2mks)

1. The flow chart below represents some industrial processes leading to the formation of two nitrogenous fertilizers.

Sulphur

Natural gas

ural gas

Air

Contact process

Process 1

SO3

Hydrogen

Nitrogen

Process 2

Compound y

H2SO 4(1)

Ostwald process

Compound x

Ammonium Nitrate

Ammonium sulphate

1. Name the process labeled (2 mks)
2. …………………………………………………………………….

2 ………………………………………………………………….....

1. Name the catalyst used in (3 mks)
	* 1. a). Process 2

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* + 1. b). Ostwald’s process

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* + 1. c). Contact process

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1. Name each of compounds X and Y (1 mk)

X ……………………………………………………………………………………….

Y ………………………………………………………………………………………

1. Other than the catalyst named in (b) above, state two optimum conditions for process labeled 2. (1 mk)

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1. Briefly describe process 1 that leads to production of nitrogen from air. (2 mks)

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1. State ***one*** use of ammonium nitrate (1 mks)

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1. The diagram below shows part of the process in the manufacture of suphuric (VI) acid.
2. Study it and answer the questions that follow.

 

 i) Write an equation for the formation of sulphur (IV) oxide from sulphur. (1 mark)

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 ii) What is the role of concentrated sulphuric (VI) acid in chamber A? (1 mark)

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 iii) Name **two** catalysts that can be used in the catalytic chamber B. (1 mark)

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 iv) State **one** role of the heat exchanger. (2 marks)

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 c) Explain **one** way in which sulphur (IV) oxide is a pollutant. (1 mark)

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 d) What observation will be made when a few drops of concentrated sulphuric (VI) acid are added to crystals of sugar? Explain your answer. (2 marks)

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