**ASUMBI GIRLS HIGH SCHOOL**

**TERM 2 – DECEMBER 2021**

**FORM 4**

**CHEMISTRY PAPER 2**

**Name:** …………………………………………………………… **Adm No**: ………………………………

**Class:** …………………………………………………………… **Candidate’s Sign**: …………………….

**Date:** …………………………………………………………….

**233/2**

**CHEMISTRY**

**PAPER 2**

**TIME: 2 HOURS**

*Kenya Certificate of Secondary Education (K.C.S.E.)*

**FORM FOUR**

**Chemistry**

**Paper 2**

**INSTRUCTIONS TO THE CANDIDATES:**

* Write your **name** and **admission** **number** in the spaces provided above
* **Sign** and write the **date** of examination in the spaces provided.
* Answer ***all*** the questions in the spaces provided.
* All working **must** be clearly shown where necessary.
* Mathematical tables and electronic calculators can be used.

***For Examiners Use Only***

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate’s score** |
| 1 | 14 |  |
| 2 | 12 |  |
| 3 | 11 |  |
| 4 | 12 |  |
| 5 | 9 |  |
| 6 | 12 |  |
| 7 | 10 |  |
| **Total** | **80** |  |

1. The grid below shows a section of the periodic table, the letters are not the actual chemical symbol.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
| K | L |  |  | M |  | N | P |
|  | Q | R | S |  | T | V |  |
| W |  |  |  |  |  |  |  |  |

1. Name the family into which element P belongs to ( 1mk)

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1. Which two elements forms the most soluble carbonates (2mks )

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1. With a reason, identify elements in period 3 with the largest atomic radius (2mks )

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1. Write the formula of the compound formed between Q and M (1mk )

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1. State two uses of element R and for each use , state property of element R that makes lts possible for the use
2. Use ( 1mk)

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Property (1mk)

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1. Use (1mk)

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Property (1mk)

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1. Using dots and cross ,show bonding in the compound formed between R and oxygen (2mks )
2. In terms of structure and bonding explain why the oxides of element Thas relatively low boiling points (2mks)

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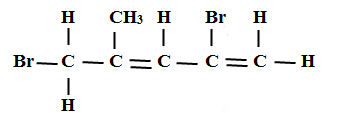
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2. (a) name the following compounds (3mks)

1. **CH3CH2CH2COOH**

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1. **CH3CH2OOCCH2CH3**

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b) Two types of detergents P and Q can be represented as

**P: R COONa**



(i) Identify each type of the detergent (2mks)

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(ii) Which of the two detergents is the best to use with hard water? Give a reason

(2mks)

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(iii) State one advantage of detergent P (1mk)

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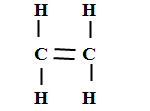
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(iv) State one disadvantage of detergent Q (1mk)

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(c) An hydrocarbon can be represented as follows



(i) Identify the hydrocarbon (1mk)

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(ii) Name two reagents that can reacted together to generate the hydrocarbon (2mks)

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3. (a) Name two apparatuses that can be used for determining mass in a laboratory (2mks)

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(b) One of the flames produced by Bunsen burner is the luminous flame

i) Explain why this flame is very bright (1mk )

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ii) State two disadvantages of the luminous flame (2mks)

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(c) Air is usually one of the substances that is considered as a mixture

(i) Identify the two most abundant component of air (2mks )

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(ii) Give two reasons why the air is considered as a mixture (2mks)

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(iii) One of the components of air is carbon (iv) oxide. Describe an experiment that can be used to prove the presence of carbon (iv) oxide in the air (2mks)

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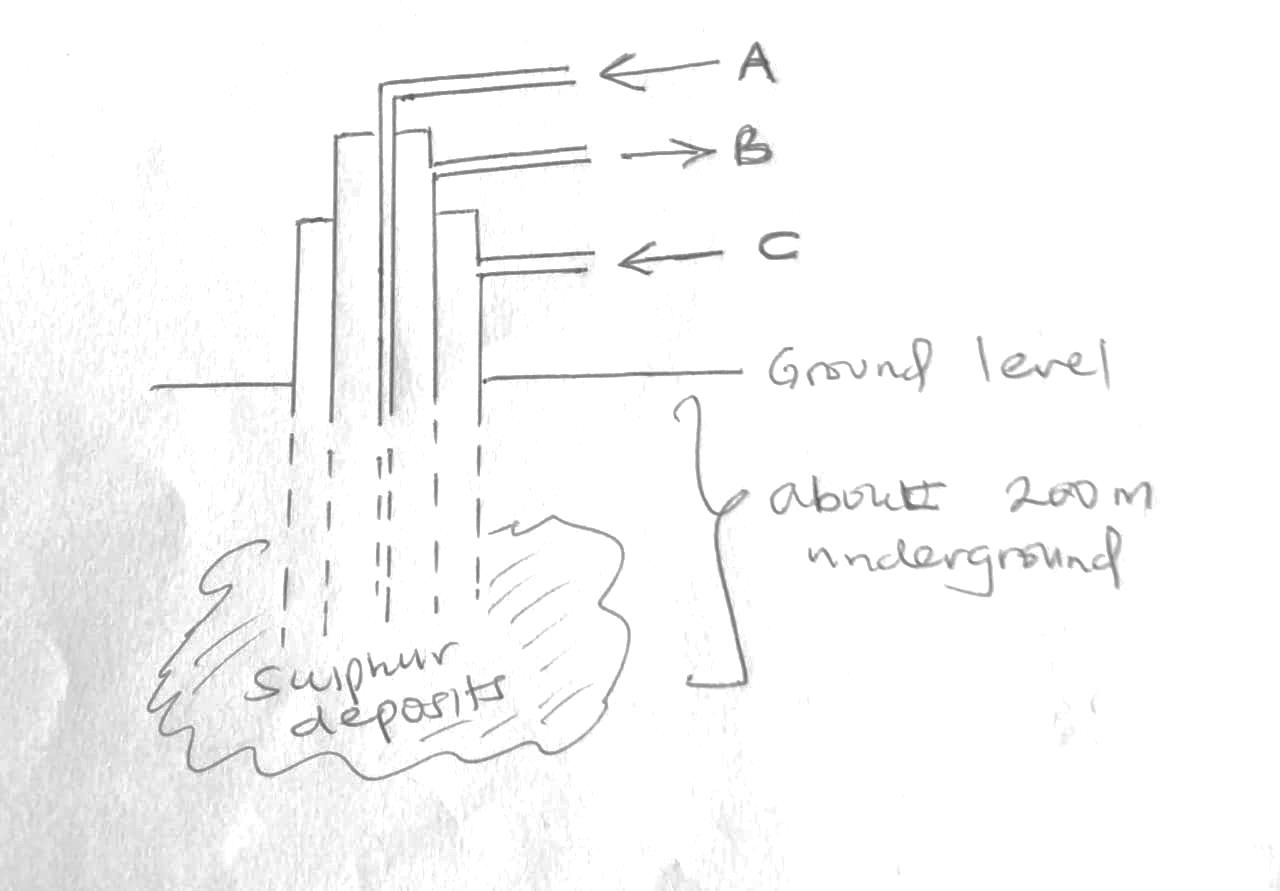
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4. (a) The diagram below shows the process used to obtain Sulphur from underground deposits



i) Name the above process used to obtain sulphur from the underground deposits (1mk)

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ii) Name the substance passed through pipe

A (1mk)

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B (1mk)

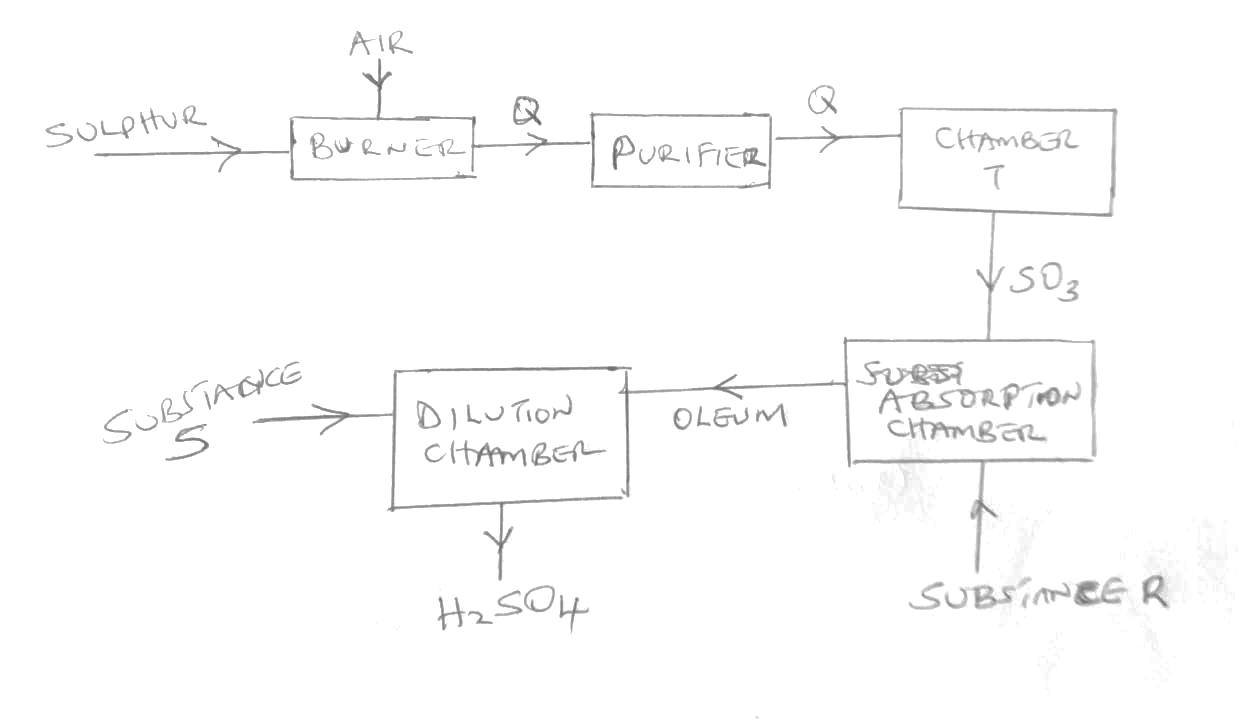
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iii) State two properties of Sulphur that makes it possible to extract using the above process (2mks)

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b) The diagram below shows the contact process used in the manufacture of concentrated sulphuric(vi) acid

i) Identify the following:

a) Substance Q formed in the burner (1mk)

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b) Chamber T (1mk)

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c) Substance R (1mk)

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d) Substance S (1mk)

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ii) Write the chemical equation occurring in the dilution chamber (1mk)

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iii) Why is it necessary to pass substance Q though a purifier (1mk)

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iv) State one use of sulphuric (VI) acid (1mk)

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5. (a) Calamine is one of the ores from which zinc can be extracted from

(i) Name any other ore from which zinc can be extracted from (1mk)

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(ii) The calamine is usually decomposed by heating to obtain substance M as shown below

ZnCO3 M + CO2

Identify substance M (1mk)

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(iii) Identify two methods that can be used to obtain zinc from substance M (2mks)

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(b) During the extraction of zinc, name two gases likely to emitted into the air and that are likely to cause pollution (2mk)

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(c) State one likely pollution effects of each of the gases you have mentioned in (a) above (2mks)

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(d) State one possible use of zinc metal (1mk)

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6. (a) define the term electrolysis (1mk)

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(b) State two functions of a salt bridge during electrolysis (2mks)

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(c) The reduction potential of elements K, L, M, and P are as given below.

K+ (aq) + e\_ K(S), E = -1.46v

L2+ + 2e\_ L(S) , E = +0.49V

M2+ M(S), E = -2.69V

N+ (aq) + e- N(s), E = +0.52 V

P+ (aq) P(s), E= - 0.86V

1. Which letter represents the, strongest reducing agent? give a reason (2mks)

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(ii) Which two letters represent elements whose half cells would form an electrochemical cell with the largest e.m.f? (1mk)

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(iii) Calculate the e.m.f of the cell formed in (ii) above (2mks)

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(d) During the electrolysis of a molten chloride of metal Q, a current of 0.25A was passed though the molten chloride for 2 hours and 10minutes. Given that 0.9grams of metal Q were deposited at the cathode.

(i) Calculate the quantity of electricity passed (1mk)

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(ii) Charge carried by the ions of metal Q given that R.A.M of metal Q is 84 (3mks)

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7 (a) starting with magnesium oxide, describe how you can obtain a dry sample of magnesium

Carbonate (3mks)

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(b) (i) Give one example of an acid salt ( 1mk)

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(ii) When sodium nitrate was heated a solid A and gas B were produced identify solid A and gas B (2mks)

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(iii) State two uses of gas B produced in (ii) above (2mks)

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(c) State two factors that should be considered when choosing a fuel (2mks)

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