

**JOINT EXAMINATION**  
**CHEMISTRY MARRKING SCHEME**

**PAPER 2**

**TERM 3 – 2023**

1.a. Name the family into which element P belongs to

**Inert or noble gases**

b. Which two elements forms the most soluble carbonates

**k and w**

c. With a reason, identify elements in period 3 with the largest atomic radius

**Q. atomic radius decreases across the period due to increase in number of protons**

d. Write the formula of the compound formed between Q and M

**$Q_5M_2$**

e. State two uses of element R and for each use, state property of element R that makes its possible for the use

**Use**

Used to make overhead power transmission cables

**Property**

Its ductile

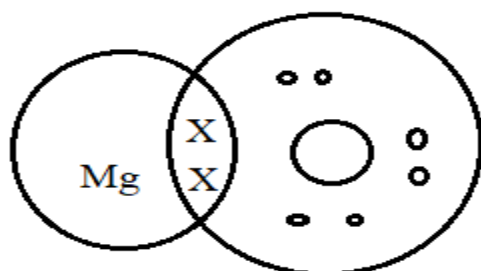
**Use**

Used to make parts of aircrafts

**Property**

Its light and malleable

f. compound formed between R and oxygen



g. In terms of structure and bonding explain why the oxides of element T has relatively low boiling points

**T forms an oxide which has a simple molecular structure. Its molecules are held by weak van der Waals forces that require little energy to break hence the low boiling point.**

2. (a) name the following compounds

**i. Butanoic acid**

**ii. 2,5- diBromo, 4-Methyl Pent -1,3- diene**

**iii Ethylpropanote**

**b** (i) Identify each type of the detergent

**p- soapy detergent**

**Q- soapless deterge**

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

**Q(soapless) the corresponding salts of calcium and magnesium are soluble hence no scum is formed**

(iii) State one advantage of detergent P

**Are cheap and biodegradable**

(iv) State one disadvantage of detergent Q

**Are expensive and nonbiodegradable**

**C I** Identify the hydrocarbon

**Ethene**

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

**Concentrated sulphuric vi acid and ethanol**

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

**Beam balance**

**Electronic balance**

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

i) Explain why this flame is very bright

**it consists mainly of unburnt tiny particles of hot glowing carbon which give out the light**

ii) State two disadvantages of the luminous flame

- **It's less hot compared to nonluminous**
- **Produces soot**

C. Air is usually one of the substances that is considered as a mixture

(i) Identify the two most abundant component of air

**Nitrogen and oxygen gases**

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

- **Its components can be separated by physical means i.e. by fractional distillation**
- **Its components are not in fixed proportions**
- **It properties are a sum of the properties of the components**

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

**Bubble the air in calcium hydroxide solution (lime water) a white precipitate is formed.**

4(a) i) Name the above process used to obtain sulphur from the underground deposits

**The Frasch process**

(ii) Name the substance passed through pipe

**A - hot compressed air at 15atmospheres**

**B-molten sulphur and water**

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

**-it has a relatively low density**

**-has a low melting point**

b. I) Identify the following:

Substance Q formed in the burner - **Sulphur IV oxide gas**

Chamber T- **catalytic chamber**

Substance R - **concentrated sulphuric VI acid**

Substance S **water**

ii) Write the chemical equation occurring in the dilution chamber



iii) Why is it necessary to pass substance Q through a purifier

**to remove impurities that may poison the catalyst and affect the efficiency of the process**

iv) State one use of sulphuric (VI) acid

- **manufacture fertilisers**

- **manufacture detergents, dyes and paints, plastics**

- **as an electrolyte in lead acid accumulators**

5. (a) (i) Name solid Q.

**Anhydrous calcium chloride**

(ii) What is the purpose of NaOH(aq)?

**To absorb carbon IV oxide gas**

(iii) Write an equation for the reaction which took place in tube P.



(iv) Give the name of one impurity in the nitrogen gas obtained

**Argon gas**

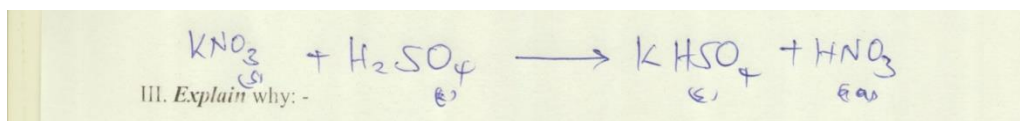
iv) Why is liquid nitrogen used for storage of semen for artificial insemination

**It is an inert liquid at a very low temperature which prevents the destruction of the specimen**

I. Give the name of liquid R

## Concentrated sulphuric acid

II. Write an equation for the reaction which took place in the retort flask.



III. **Explain** why: -

(a) Nitric acid is not stored in clear/transparent glass.

**Its highly volatile, it decomposes in the presence of sunlight to nitrogen IV oxide water and oxygen**

(b) The reaction between copper metal with 50% nitric acid (*one volume of acid added to an equal volume of water*) in an open test tube produces brown fumes

**copper reacts with acid to form nitrogen II oxide; nitrogen II oxide is then oxidised by atmospheric oxygen in nitrogen IV oxide which is brown fumes**

6 i) State the condition necessary in step 1

**heat**

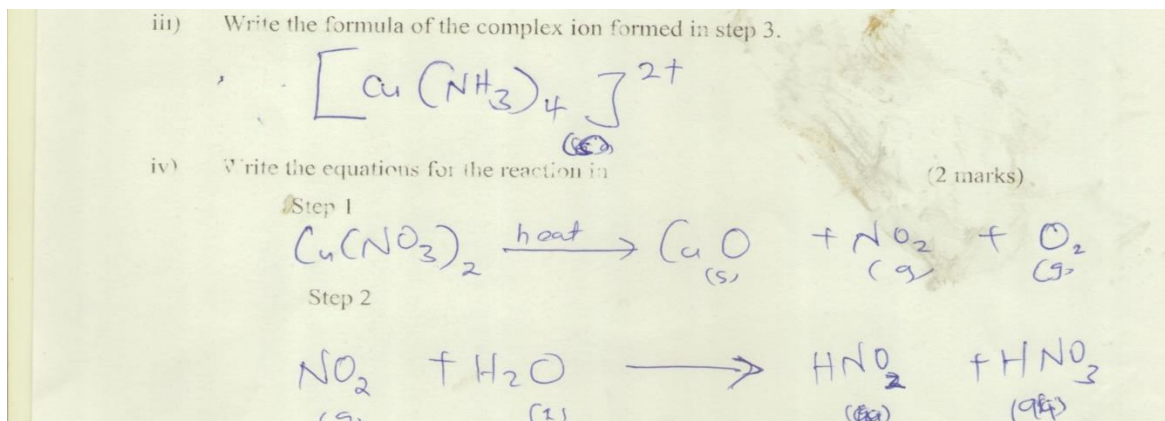
ii) Identify:

Reagent M- **any soluble carbonate, (sodium/ potassium)**

gas S - **oxygen gas**

product T - **Nitric III acid**

**V - nitric V acid**



7. (a) Name substances **A, B, C** and **D**.

(4mks)

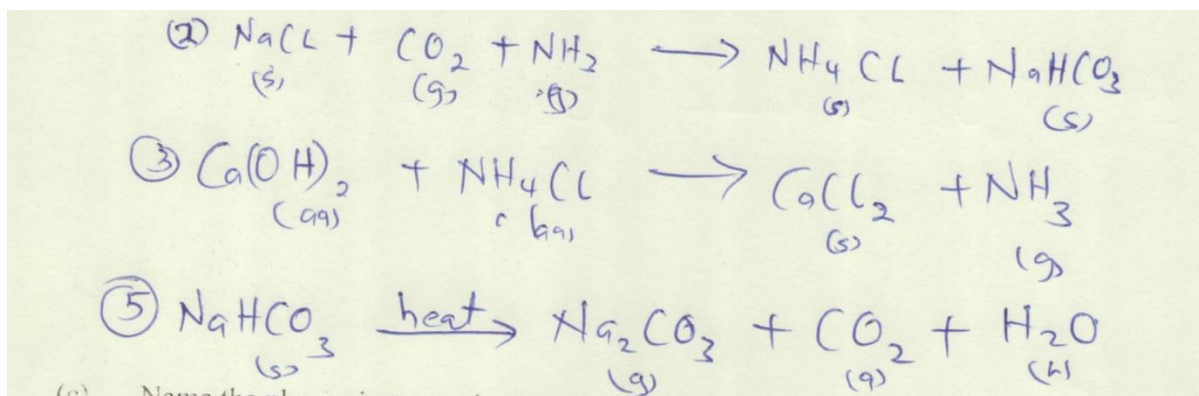
**A- ammonical brine**

**B – sodium hydrogen carbonate**

**C – ammonium chloride**

**D- calcium chloride**

- (b) Write equation for the reactions taking place in chamber 2, 3 and 5



- (c) Name the physical process in chamber 4 and 5.

**Chamber 4 – filtration**

**Chamber 5 -heating**

- (d) Name **one** source of carbon (IV) oxide for Solvay process.

**Heating lime stone or calcium carbonate.**

- (f) give 2 uses of sodium carbonate

- making of glass

- in paper industry

softening hard water

- making sodium silicate that is used in making detergents