

Muongano KCSE Post Trial Exam

233/1

CHEMISTRY

PAPER 1

September 2015

2 Hours

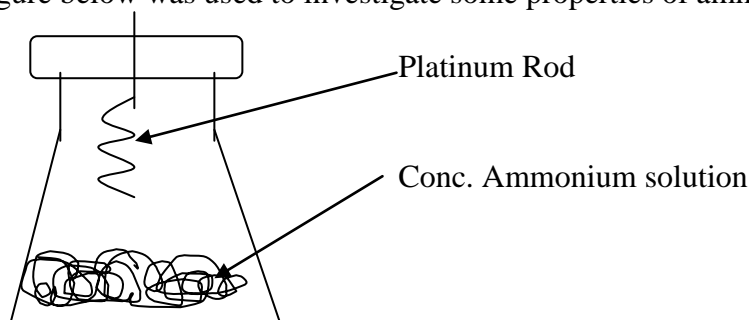
1 (a) **What** name is given to the process by which alcohol is formed from a carbohydrate? (1mk)

(b) **Explain why** the solubility of propane in water is lower than that of propanol (2mks)

2 Starting with 20cm^3 of $0.5\text{M HCl}_{(\text{aq})}$. **Describe how** a pure sample of sodium chloride crystals can be prepared in the laboratory (3mks)

3 A mixture contains Aluminum chloride, Copper II Oxide and sodium nitrate. **Describe how** each sample can be obtained from the mixture (3mks)

4 The figure below was used to investigate some properties of ammonia gas.



(a) **State and explain** the observation in the conical flask (2mks)

(b) State two uses of ammonia gas (2mks)

5 100cm^3 of a sample of methane gas diffuses through a porous pot in 50 seconds. **What** is the molecular mass of gas Y if 100cm^3 of the gas diffuses through the same pot in 120 seconds under the same conditions? (C = 12, H = 10) (3mks)

6. (a) **Distinguish** between efflorescent and hygroscopic substance. (2mks)

(b) **Give one use** of hygroscopic substances in the laboratory (1mk)

7. Lead II Oxide reacts with both acids and bases.

(a) **Write an equation** for the reaction between Lead II Oxide and one acid and one base. (2mks)

(b) **What property** of lead II oxide is shown by the above reactions? (1mk)

8. **Draw and name** the geometric Isomers of Butene (2mks)

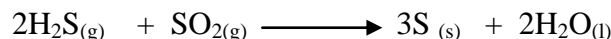
9. A beaker contained 75.0cm^3 of aqueous Copper II Sulphate at 23.7°C ; when scrap iron metal was added to the solution, the temperature rose to 29.3°C .

(a) **State two** other observations made (1mk)

(b) **Write an ionic equation** for the reaction that took place (1mk)

(c) Given that the mass of copper deposited was 2.4g, **calculate** the heat change for the reaction. (SHC $4.2\text{J/g}\cdot\text{K}$ and Density of dilute solution is 1g/cm^3) (2mks)

10. (a) One of the uses of hydrogen sulphide is to produce sulphur as shown in the following equation.



Identify the reducing agent in this reaction and **give a** reason for your answer. (2mks)

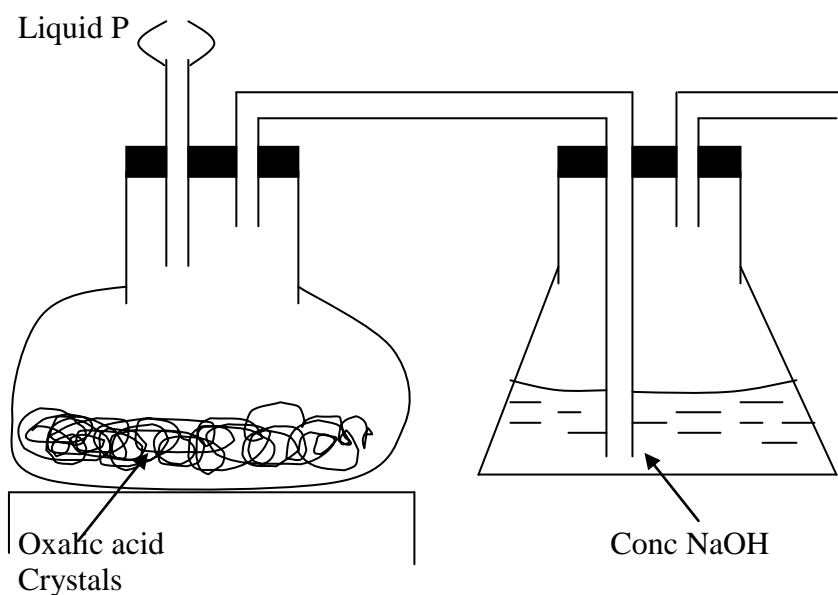
(b) Other than production of Sulphuric VI acid, **state one** commercial use of Sulphur (1mk)

11. Draw dot (.) and cross (x) diagram for a molecule of

(i) H_2O_2 ($H=1$ $O=8$) (1mk)

(ii) NH_4^+ ($N=7$ $H=1$) (1mk)

Q12. The set up below can be used to prepare carbon II oxide gas.



(a) Identify Liquid P (1mk)

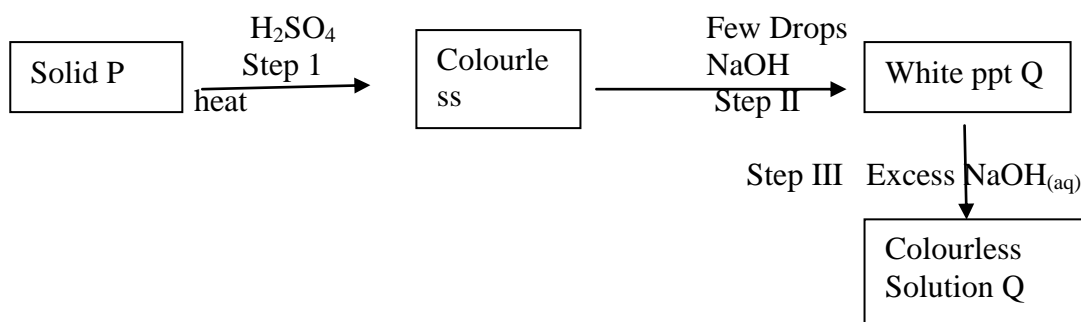
(b) Write an equation for the reaction that occurs in the round bottomed Flask (1mk)

(c) Complete the diagram to show how a sample of the gas can be collected. (1mk)

(d) Carbon dioxide is a silent killer. **State two** physical properties of carbon dioxide which makes it a silent killer (1mk)

13. Oxygen and sulphur belongs to the same group of the periodic table. **Explain why** H_2S is a gas at room temperature while H_2O is a liquid at room temperature (2mks)

14. The scheme below shows some reactions starting with solid P. Study it and answer the questions that follow



- (a) Write the formulae of the complex ion in solution **Q** (1mk)
- (b) **Write an equation** for the reaction in step 1. (1mk)
15. An equilibrium exists as shown below:

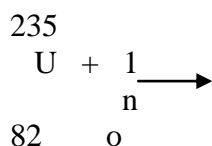


State and **explain** the effect of increasing the temperature of the above system on the yield of SO_3 (2mks)

16. When fuels burn in the internal combustion engine at high temperature, one of the products formed is nitrogen II oxide.
- (a) **Write the equation** for the formation of nitrogen II oxide (1mk)
- (b) **Give a reason why** nitrogen II oxide is not formed at room temperature (1mk)
- (c) **Describe how** formation of nitrogen II oxide in the internal combustion engine leads to gaseous pollution (1mk)

17. (a) **Differentiate** between the terms isotopes and allotropes (1mk)
- (b) **State one** element that has both (1mk)

18. Complete the nuclear equation below



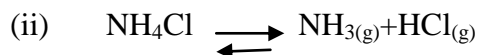
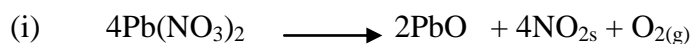
- (a) (i) **Name** the above process (1mk)
- (ii) **Give one** use of the process (1mk)
- (b) **Give one** useful effect of radio isotopes (1mk)

19. A solution of aluminum chloride in methylbenzene does not produce effervescence when sodium carbonate is added to it, while a solution of aluminum chloride in water does. **Explain**

(2mks)

Q20. **Name** the following processes.

(2mks)



Q21. Study the table below and answer questions that follow

Substance	Conductivity of element at room temperature	Solubility in water
A	Does Not	Highly soluble
B	Conducts	Does not Dissolve
C	Does not conduct	Dissolves

Which of the substances is likely to be:

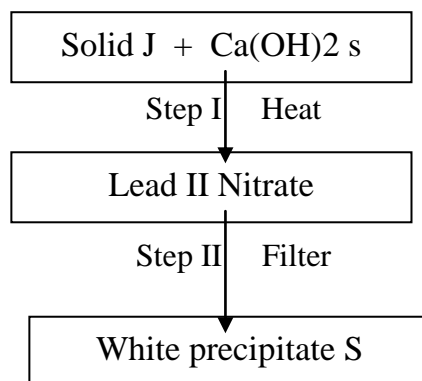
(i) HCl? **Explain**

(1mk)

(ii) NaCl? **Explain**

(1mk)

22. Study the flow chart below and answer the questions that follow



(a) **Write an equation** between **J** and $\text{Ca}(\text{OH})_2$ solid

(1mk)

(b) **Identify** white precipitate **S**

(1mk)

23. Ethyne is prepared in the laboratory by the action of calcium carbide on water.

(i) **Write an equation** for the above reaction

(1mk)

(ii) **What** would be the effect of the resulting solution on red litmus paper? **Explain.**

(2mks)

24. (i) **What** is heating value of a fuel?

(1mk)

(ii) **State two** other factors to consider when choosing a fuel for domestic use (1mk)

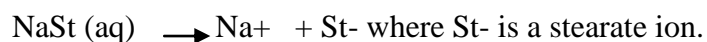
25. **Explain** the following observations

(i) It is not advisable to use a stopper made of rubber in the set up for production of Nitric (V) Acid (1mk)

(ii) A sample of sugar changes to black and froths when concentrates sulphuric VI Acid is added to it. (2mks)

26. A sample of river water is suspected to contain zinc and sulphate ions. **Describe how** the presence of zinc ions and sulphate ions can be established (3mks)

27. Soap dissolves in water according to the equation below



(a) **Write the formula** of the scum formed when soap is used in hard water. (1mk)

(b) **Write an ionic** for the reaction that occurs when sodium carbonate is used to remove hardness in water. (1mk)

28. Under certain conditions, chlorine gas reacts with sodium hydroxide to form sodium chlorate.

(a) **Name the condition** under which sodium hydroxide reacts with chlorine to form sodium chlorate (1mk)

(b) **State two** uses of sodium chlorate (1mk)

29a. **Explain why** it is not advisable to use wood ash for cleaning aluminum utensils (2mks)

(b) Duralumin is an alloy of aluminum. **What is** the advantage of using duralumin in place of aluminum for manufacture of aeroplane parts (1mk)

30 (a). **State what** would be observed when dilute hydrochloric acid is added to the products formed when a mixture of iron fillings and sulphur is heated. **Explain** (2mks)