

NAME..... INDEX NO.....

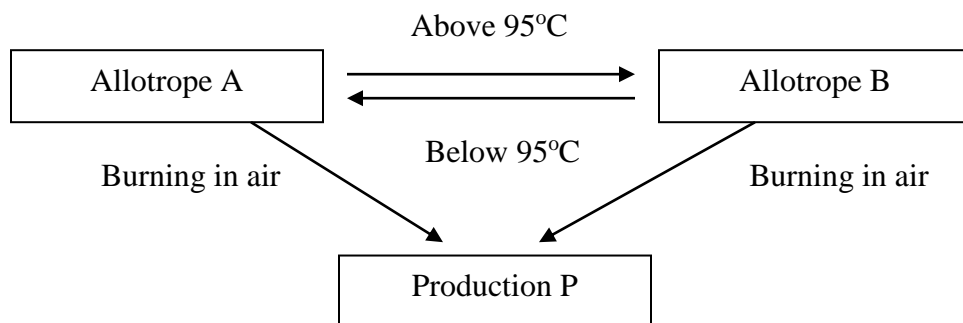
233/1  
CHEMISTRY  
PAPER 1  
JULY/AUGUST – 2009  
2 HOURS

**BARINGO – KOIBATEX DISTRICTS EDUCATIONAL  
IMPROVEMENT EXAM – 2009**

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

233/1  
Chemistry  
Paper 1  
July/August 2009  
2 Hours

1. The flow chart below some properties of two allotropes of element P



(i) Name the allotrope A ( 1 mk)

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(ii) Write an equation to show formation of product P ( 1 mk)

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2. Element Z forms an ionic oxide of formula  $Z_2O_3$  ( 1 mk)

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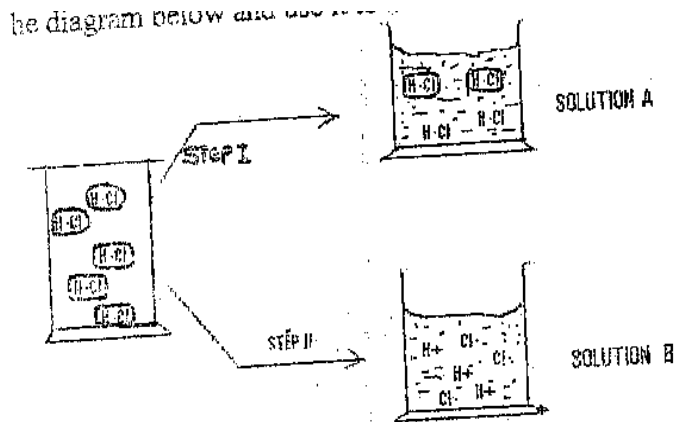


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3. Study the diagram below and use it to answer the questions that follow



- (a) Identify the solvents used in step 1 and step II ( 1 mk)

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- (b) One spatulaful of sodium hydrogen carbonate was poured into each sample. What observation were made? Explain ( 2 mk)

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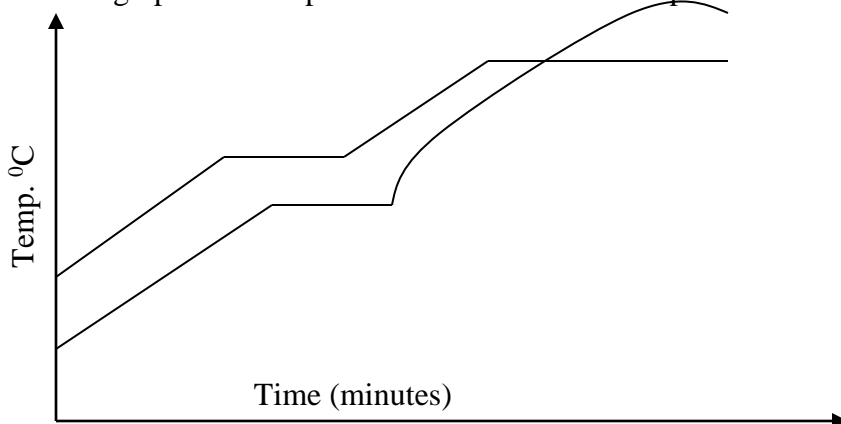


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4. Two samples of a similar substance from different containers were investigated. The graph below represents the variation of temperature with time when heated.



(a) Explain the variation in the curves of:

Sample I \_\_\_\_\_ ( 1 mk)

\_\_\_\_\_

Sample II \_\_\_\_\_ ( 1 mk)

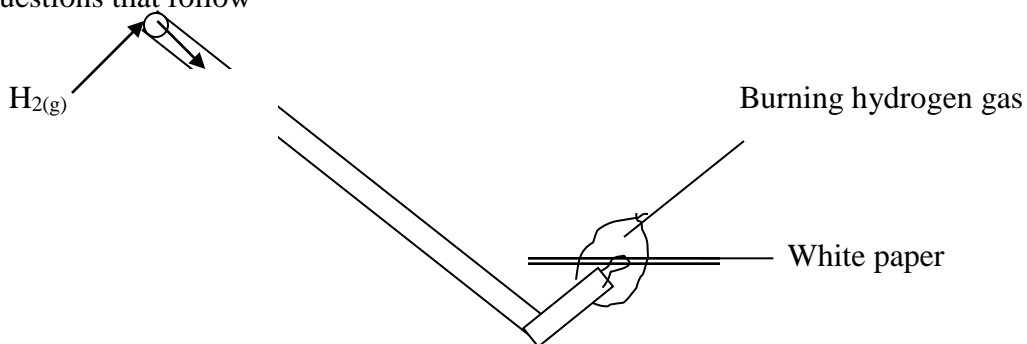
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(b) Common salt is sprinkled on roads during winter in temperate countries

Explain \_\_\_\_\_ ( 1 mark)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. The following test was done with a piece of a white paper. Study it and answer the questions that follow



(a) State observations giving an illustration \_\_\_\_\_ ( 1 mk)

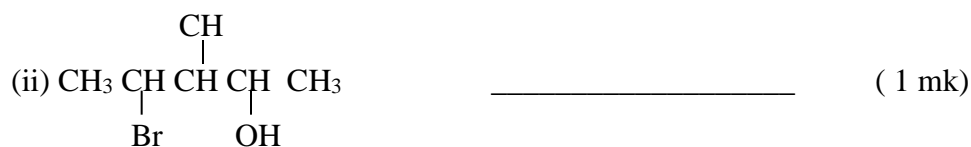
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\_\_\_\_\_  
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(b) Write an equation for the reaction taking place at part A \_\_\_\_\_ ( 1 mk)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. A bicycle was found to hold a maximum volume of  $990\text{cm}^3$  at s.t.p. On one hot sunny day. The temperature was  $30^\circ\text{C}$  and pressure  $800\text{mmHg}$ . The rider inflated his tyre. Explain what happened. Show your calculations ( 3mk)

7. (a) Give the names of the following compounds ( 1 mk)



- (b) Butane and bromine react as shown below



- (i) Name the type of reaction taking place in the equation above ( 1 mk)

\_\_\_\_\_

- (ii) State the conditions under which the above reaction takes place ( 1 mk)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. With use of diagrams distinguish between flat bottom flask and volumetric flask ( 2 mks)

9. A given element Q has atomic number 14 and consists of isotopes as shown below

Isotope	X	Y	Z
Isotopic mass	28	29	30
Percentage abundance	92.2	4.7	3.1

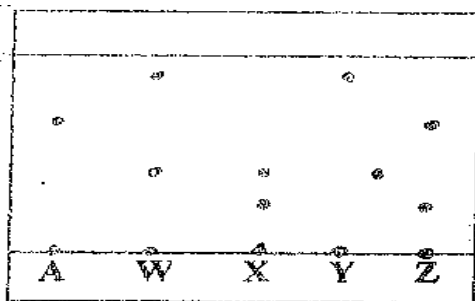
- (a) Determine the relative atomic mass of Q ( 2 mks)

- (b) State the group and periodic table to which Q belongs

Group \_\_\_\_\_ ( ½ mk)

Period \_\_\_\_\_ ( ½ mk)

10. The diagram below shows the chromatogram of your urine samples of four athletes. A shows the spread of banned substances. W,X,Y and Z represent the sample from the four athletes



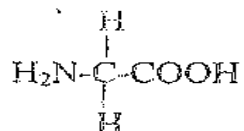
- (a) What does T represent? ( 1 mk)

- (b) Which athlete urine sample contained banned substance? ( 1 mk)

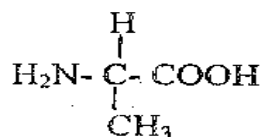
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11. A piece of cheese contains protein which are natural polymers made up of amino acids shown

Glycine



Alanine



(a) Name the type of polymerization involved in protein formation ( 1 mk)

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(b) Show the structural formula of the polymer formed when the amino acids polymerize ( 1 mk)

(c) By the reaction given below



12. (a) On the axes given below draw an energy level diagram showing the catalysed and uncatalysed reaction



- (b) State the effects on formation of hydrogen bromide if pressure was increased

In equation above. Explain

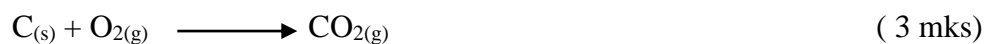
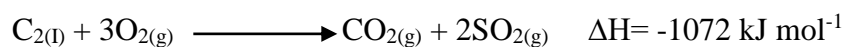
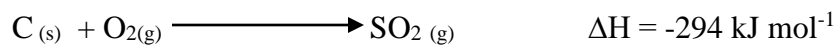
( 1mk )

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13. Calculate the standard enthalpy of formation of carbon disulphide, given;



14. State the conditions under which ammonia gives the following products when heated.

(i) Nitrogen and hydrogen

( 1 mk )

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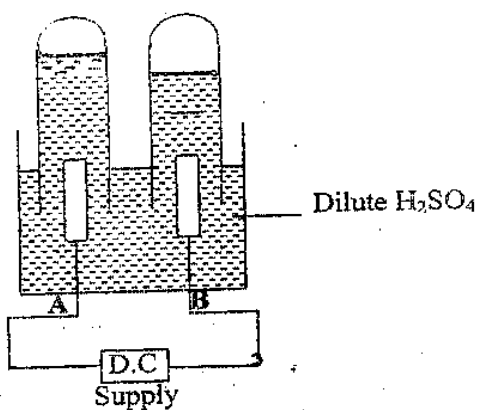
(ii) Nitrogen and water

( 1 mk)

(iii) Nitrogen (ii) oxide and water

( 1 mk)

15.



The diagram was used to pass electric current into dilute solution of sulphuric acid

(a) Label the electrodes A and B

( 1 mk)

(b) Name the product at each electrode and give a confirmatory test for each ( 2 mks)

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16. State the number of named particles in the following species

(i) Electrons in

( 1 mk)

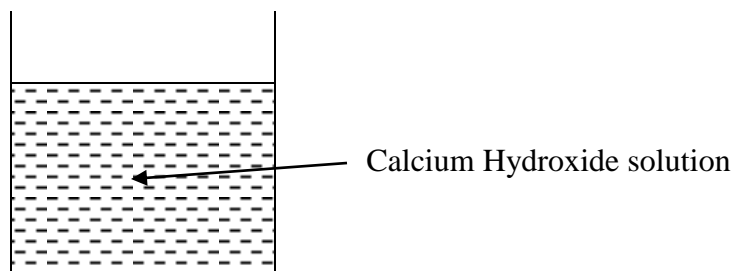
(ii) Neutrons in

( 1 mk)



17. An excess of Zinc powder was added to  $100\text{cm}^3$  of  $0.5\text{M}$  copper (II) sulphate solution and the temperature changed from  $20^\circ\text{C}$  to  $26.5^\circ\text{C}$ . Calculate the molar heat of reaction given that the specific heat capacity of water =  $4.2\text{Jg}^{-1}\text{K}^{-1}$  and the density of the solution is  $1\text{gcm}^{-3}$  ( 3 mks)

18. The beaker containing calcium hydroxide solution was left in the open air for 1 day as shown in the diagram below



- (a) State the observation made ( 1 mk)
- 
- 

- (b) Write an equation of reaction that occurs for the observation made in (a) above.
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19. In the extraction of Iron metal, limestone (calcium carbonate) is added at a certain stage.

- (i) Explain the main role of limestone ( 1 mk)

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(ii) Name two reducing agents in the extraction of iron (1 mk)

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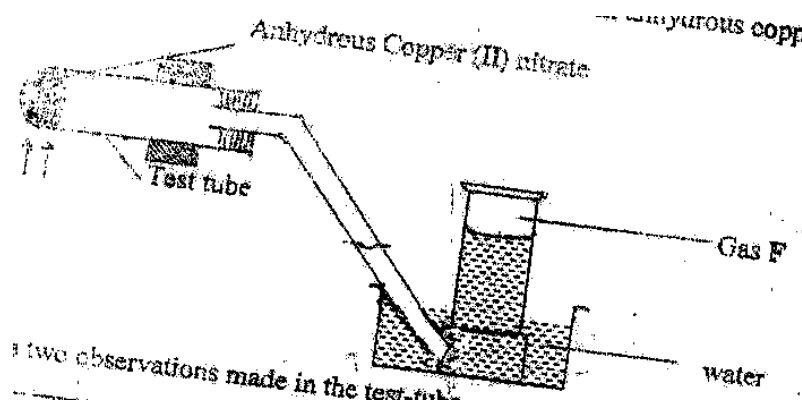
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(iii) State two ways in which impurities affect the properties of iron

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20. The set-up below was used to collect the gas produced when anhydrous copper(II) nitrate is strongly heated.



(a) State two observations made in the test – tube (2 mks)

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(b) Identify gas F (1 mk)

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21. A bottle containing nitric acid has a label with the following information

Density =  $1.42\text{g/cm}^3$

Percentage purity by mass = 68%

Calculate the concentration in moles per litre of nitric acid (3 mks)

(C10, N = 1+ 0, O = 16.0)

22. The following information is for two chlorides of element A and B

Chloride Mpt ( $^{\circ}\text{C}$ )	Bpt ( $^{\circ}\text{C}$ )	Solubility in 100g of water	Solubility in 100g of benzene
800	1140	38	0.07
23	77	0.08	Very soluble

(a) Which chloride has a molecular structure? Explain (1 mk)

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(b) Which of the elements A and B could be a metal? Explain (1mk)

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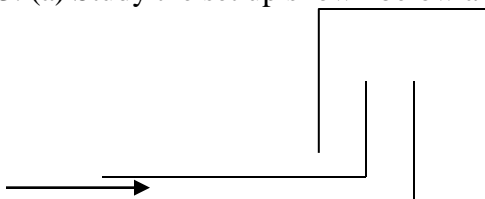
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(c) Explain the differences in solubility of the chloride in water (1mk)

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23. (a) Study the set up shown below and answer the questions that follow



(i) Name the method shown by the diagram (1 mk)

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(ii) State the property of the gas (1 mk)

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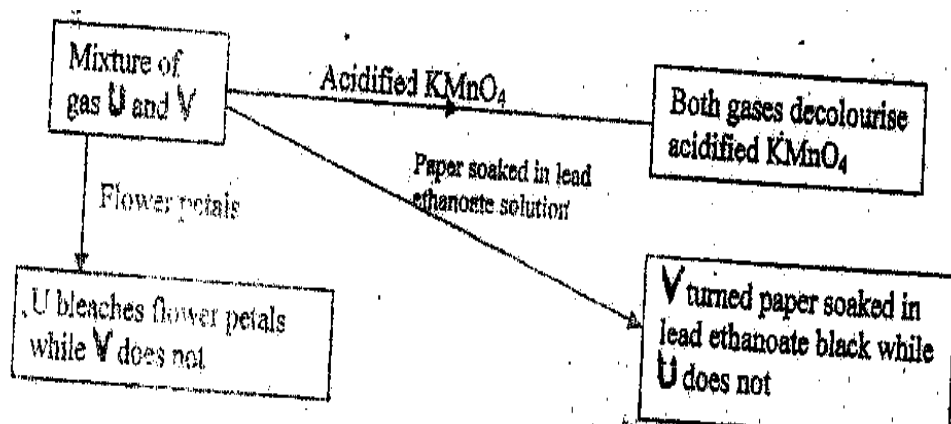
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(b) a typical school laboratory is designed to have two exit doors. Explain (1 mk)

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



(a) Identify gases U and V (2 mks)

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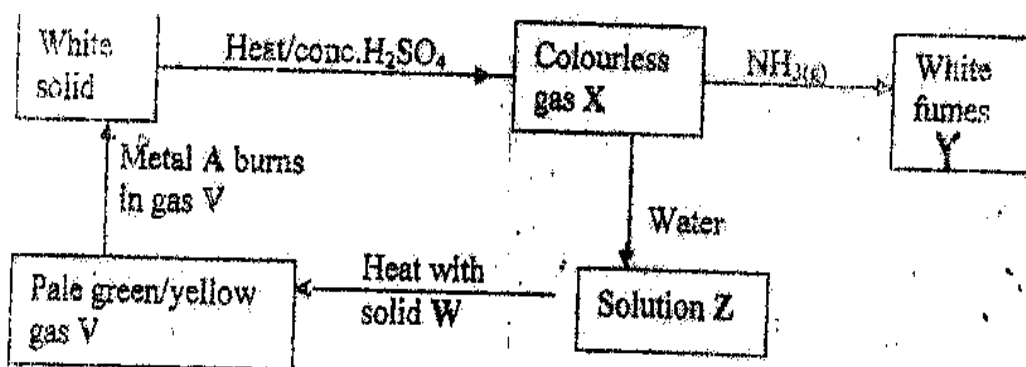
(b) Give an equation of the reaction that take place when moist gas V and U react (1 mk)

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25. The solubility of copper (II) sulphate at  $15^{\circ}\text{C}$  is 19.0g. Its solubility at  $75^{\circ}$  is 55g. What mass of crystals would be deposited if 77.5g of copper (ii) sulphate solution, saturated at  $75^{\circ}\text{C}$  is allowed to cool to  $15^{\circ}\text{C}$  ( 3 mks)

26. Study the scheme below and answer the questions that follow



- (i) Write an equation for the formation of white fumes Y ( 1 mk)
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- (ii) What is the function of solid W in the reaction? ( 1 mk)
- 
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- (iii) Identify gas V (1 mk)

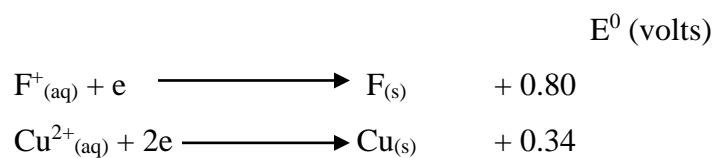
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27. The radioactive element weighed 384g. After 270 days, its mass fell to 48g  
Calculate half- life of the element (3 mks)

28. Calculate the oxidation number of sulphur in  $S_2O_3^{2-}$  (2 mks)

29. A strip copper metal was immersed in nitrate solution of metal F overnight. Use the information given below to answer the questions that follow.



(a) State the observations made at the end of the experiment (1mk)

(b) Give a reason for the observations made in (a) above (1 mk)

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30. An element has atomic radius of 0.136nm and an ionic radius of 0.065nm. Is this element a metal or non- metal? Give reasons ( 2 mks)

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