
**KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS**

**NAIROBI SCHOOL
CHEMISTRY
PAPER 2
TIME: 2 HOURS**

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**NAIROBI SCHOOL KCSE TRIAL AND
AND PRACTICE EXAM 2016
Paper 2**

1. The grid below represents part of the periodic table. Study it and answer the questions that follow:

The letters given do not represent the actual symbols of the element

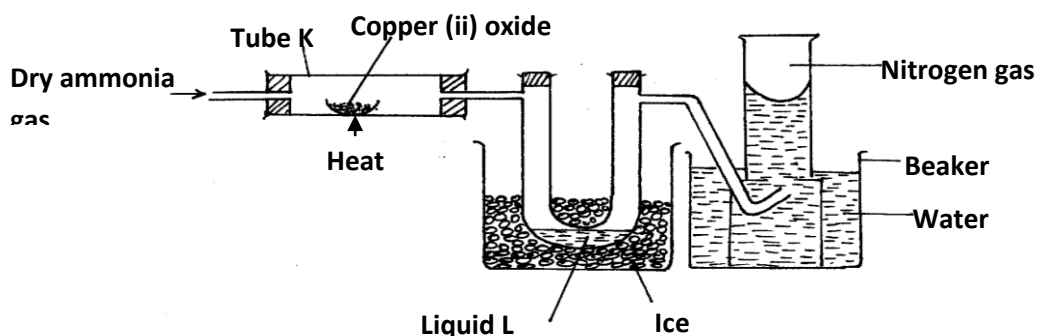
					A		
	B		C		D		E
F	G						
							H

- (i) Select the element that can form an ion with a charge of -2. Explain your answer. (1mk)
- (ii) What type of structure would the oxide of **C** have? Explain your answer. (1mk)
- (iii) How does reaction of **H** compare with that of **E**? (2mks)
- (iv) 1.3g of **B** reacts completely when heated with 1.21 litres of Cl_2 (g) at STP (1 mole of gas at STP occupies 22.4 litres)
- (i) Write a balanced equation for the reaction between **B** and Cl_2 (1mk)
- (ii) Determine the relative atomic mass of **B**. (2mks)
- (v) Explain how you would expect the following to compare.
- (a) Atomic radii of **F** and **G** (1mk)
- (b) The pH values of aqueous solution of oxides of **B** and **D** (1mk)
- (vi) The table below shows some physical properties of some substances. Use the information in the table to answer the questions that follow.

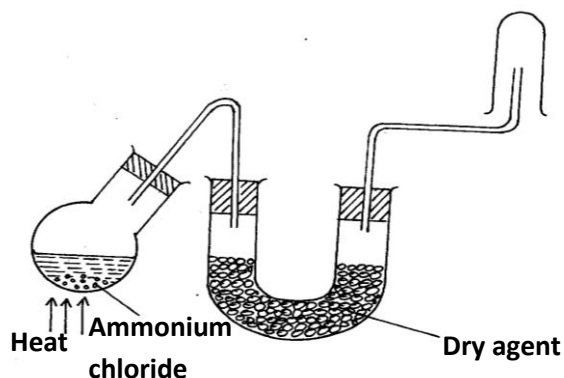
Substances	Melting	Boiling point °C	Electrical conductivity	
			Solid	Solid
U	1083	2595	Good	Good
V	801	1413	Poor	Good
W	5.5	80.1	poor	Poor
X	-114.8	-84.9	Poor	Poor
Y	3550	4827	Poor	Poor

- (i) Which substance is likely to be
- (i) A metal (1mk)
- (ii) Liquid at room temperature (1mk)
- (ii) Which substance is likely to have the following structures?
- (i) Simple molecular (1mk)
- (ii) Giant atomic (1mk)

2. The diagram below shows the set up that can be used to obtain nitrogen gas in an experiment carried out by form 3 of Boseti. Sec school.



- (i) How is the ammonia gas from this process dried? (1mk)
 - (ii) Name liquid L? (1mk)
 - (iii) What observation would be made at tube K at the end of the experiment? (1mk)
 - (iv) Write an equation for the reaction that took place in the tube K. (1mk)
 - (v) At the end of the experiment the pH of water in the beaker was found to be 10.0. Explain. (1mk)
- (b) A student set up the following apparatus for preparing jars of dry ammonia but found that no gas collected in the gas jars, although a reaction occurred in the flask.



- (i) Explain why there was no gas collected? (1mk)
- (ii) The following alterations were made
 - Using a mixture of ammonium chloride and an alkali, Ca(OH)_2 instead of NH_4Cl
 - The flask was made to slope with neck downward.

State the reason for each alteration above (2mks) (iii)

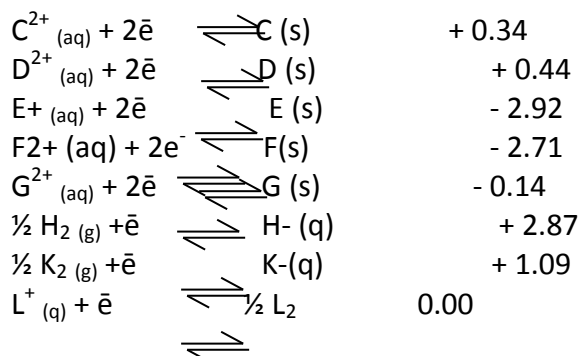
When ammonia gas is passed into a jar of hydrogen chloride gas, white fumes are formed. Explain with an aid of equation of reaction. (2mks) (iv)

Ammonia decomposes if sparked electrically, what would you expect to be the products of the decomposition? (1mk)

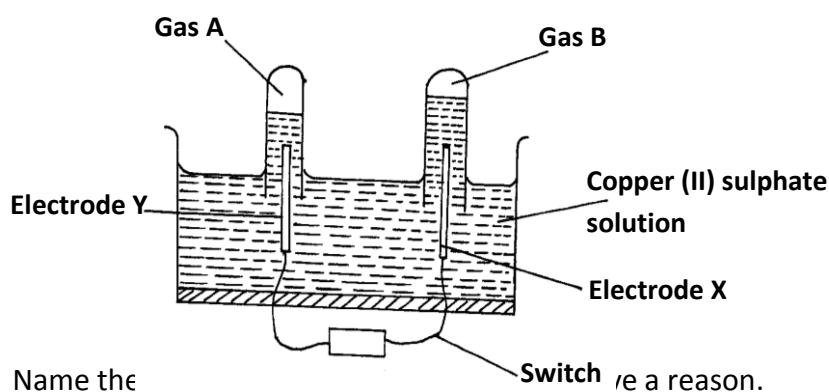
3. (a) Use the information below on standard electrode potentials to answer the questions that follow.

Electrode reaction

E^\ominus Volts



- (i) Identify the strongest reducing agent and the strongest oxidizing agent. Give reason (2mks)
- (ii) Calculate the e.m.f of the cell formed by connecting half cells **C** and **D**. (1mk)
- (iii) Draw and label a diagram of a cell formed by connecting half cells of **E** and **D**. on the Diagram. Indicate the flow of elections. (3mks)
- (b) An aqueous solution of copper (ii) sulphate was electrolysed using platinum electrodes. When a current was passed a gas that relights a glowing splint was produced

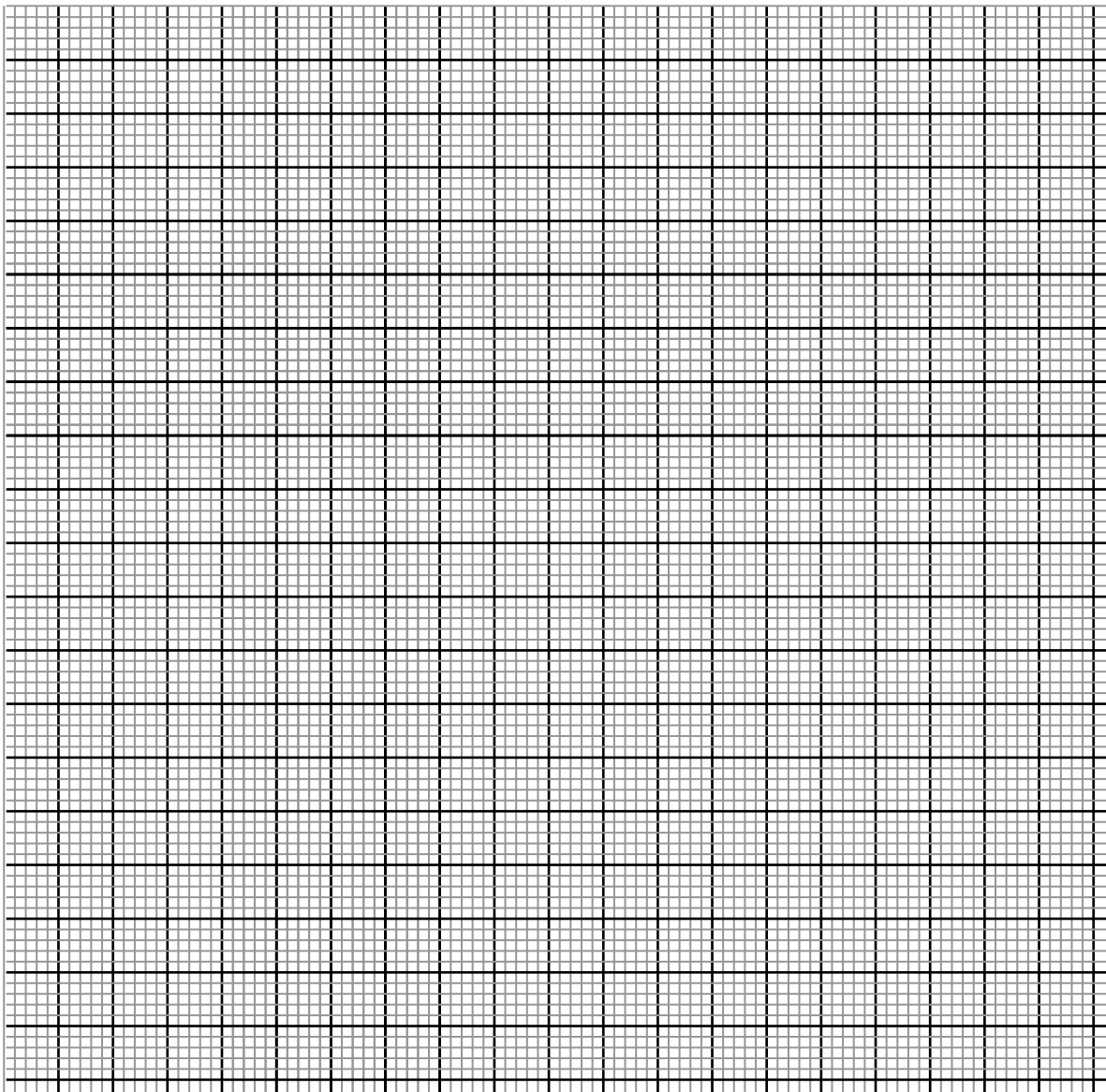


- (i) Name the (1mk)
- (ii) Write an equation for the reaction at the anode. (1mk)
- (iii) 0.11g of metal **R** deposited by electrolysis when a current of 0.03 amperes flow for 99 minutes ($R = 92, 1F = 96500C$)
- I.. Find the number of moles of **R** deposited (1mk)
 - II. Find the number of moles of electrons passed. (1mk)
 - III. Determine the value of **n** in the metallic ion in R^n (2mks)

4. The table below shows the change in concentration of Bromine liquid against time.

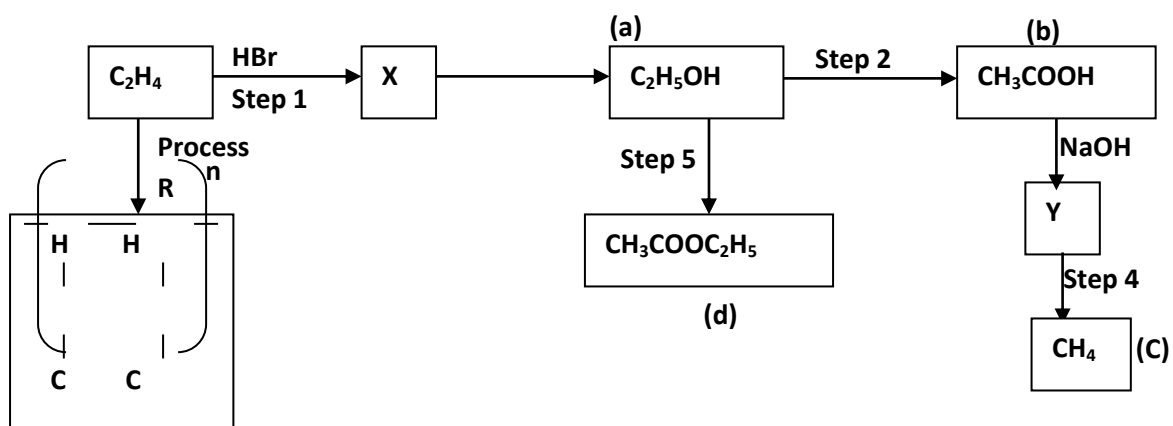
Concentration of Br_2 (l) mol/dm^3	Time in minutes
10.0×10^3	0
8.1×10^3	1
6.6×10^3	2
4.4×10^3	4
3.0×10^3	6
2.0×10^3	8
1.3×10^3	10

Plot a graph of concentration of bromine (vertical axis) against time. (3mks)



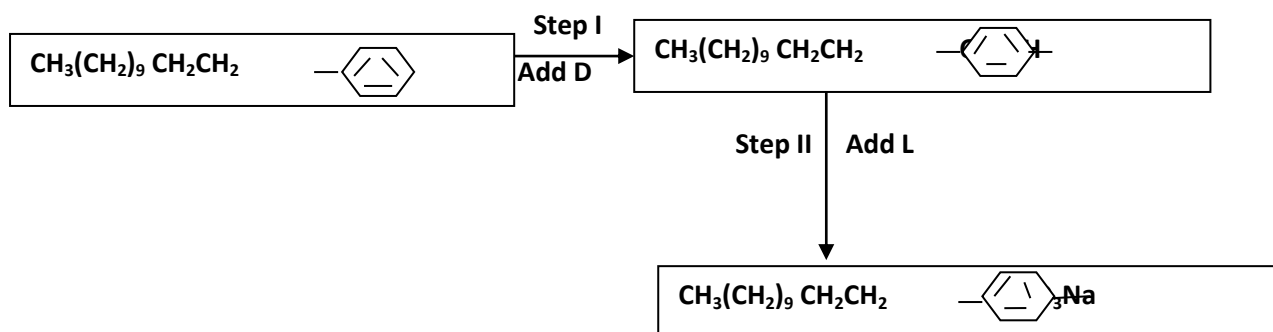
- (b) From the graph determine
- (i) The concentration of bromine at the end of 3 minutes (1mk)
 - (ii) The rate of reaction at $t = 1\frac{1}{2}$ minutes. (2mk)
- (c) Explain how the concentration of bromine affects the of the reaction 2mks
- (d) On the same axis, sketch the curve that would be obtained if the reaction was carried out at 20°C and label the curve as curve II. Give a reason for your answer. (2mks)

5. The scheme show the reaction starting with Ethane

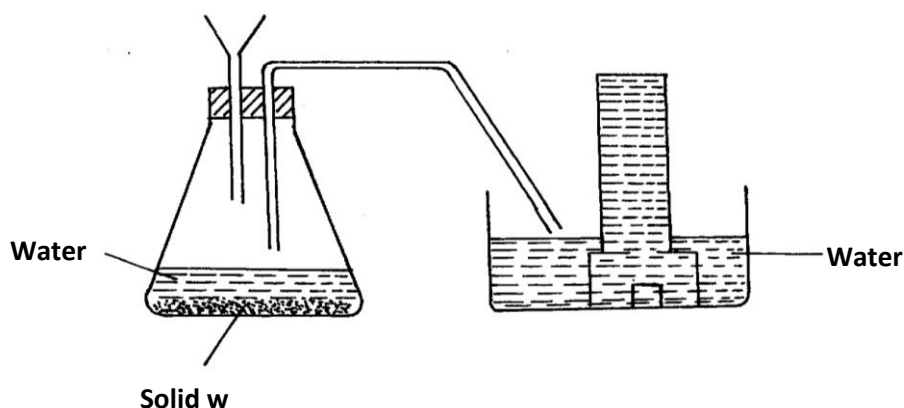


- (i) Name the compound **a**, **b**, **c** and **d** (2mks)
- (ii) Give the formulae and name of **X** (1mk)

- (iii) Name the reagent and condition needed to carry out steps 2 and 5 . (2mks)
 (iv) Write a balanced equation which lead to the formation of substance Y (1mk)
 (v) Name process R in the above schematic diagram. (1mk)
 (b) The flow chart below shows the manufacture of a cleansing agent.

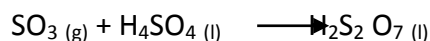


- (i) Identify each of the substance D and L (2mks)
 (ii) Give **one** advantage of using this cleansing agent over ordinary soap (1mk)
 (iii) What is the effect of the above cleansing agent to the environment. (1mk)
6. The diagram below shows a set up used by a student in an attempt to prepare and collect oxygen.



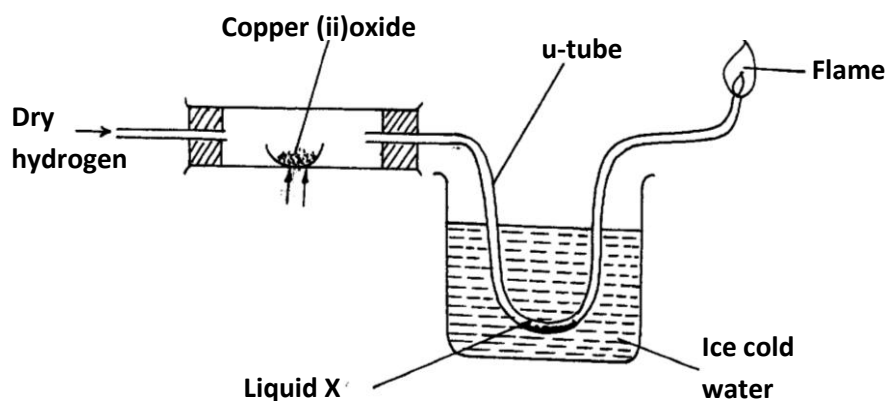
- (i) Complete the diagram by correcting the mistakes in it (2mks)
 (ii) Identify solid W. (1mk)
- (b) A piece of phosphorous was burnt in excess air. The amount of hot water to make a solution.
- (i) Write an equation for the burning of phosphorus in excess air. (1mk)
 (ii) The solution obtained in (b) above was found to have a pH of 2.0. Give reasons for this observation. (2mks)
- (c) Explain why cooking pots made of aluminium do not corrode easily when exposed to air. (1mk)
- (d) The reaction between sulphur (IV) oxide and oxygen to form sulphur (VI) Oxide per day (Condition for the reaction a catalyst, 2 atmospheric pressure and temperature between $400^\circ - 500^\circ\text{C}$)
- $$2\text{SO}_{2(\text{aq})} + \text{O}_{2(\text{g})} \rightleftharpoons 2\text{SO}_{3(\text{g})}$$
- Factory manufacturing sulphuric acid by contact process produces 350kg of sulphur trioxide per day (conditions) for the reaction catalyst. 2 atmospheres pressure and temperatures between $400^\circ - 500^\circ\text{C}$.
- (i) What is meant by an exothermic reaction? (1mk)

- (ii) How would the yield per day of sulphur trioxide be affected if temperatures lower than 400°C are used? Explain (1mk)
- (iii) All the sulphur (VI) oxide produced was absorbed in concentrated sulphuric acid to form oleum.



Calculate the mass of oleum that was produced per day. ($S = 32.0, O = 16; H = 1.0$) (2mks)

7. Dry hydrogen gas was passed over coated copper (II) oxide in a combustion tube as shown below



- (i) State and explain the observation made in the combustion tube. (2mks)
- (ii) Write an equation for the reaction that took place in the combustion tube. (1mk)
- (iii) Identify liquid **X**. (1mk)
- (iv) Give **one** chemical test that can be used to prove the identify of liquid **X** (1mk)
- (b) (i) When magnesium oxide is used in place of copper (II) oxide no liquid is formed in the u- tube dipped in ice cold water. Explain. (1mk)
- (ii) Write an equation for the reaction at flame point. (1mk)