

Name Index No.

School

Candidates signature

233/2

Date

CHEMISTRY

Paper 2

(Theory)

July/August 2016

Time : 2 Hours

KERICHO WEST FORM 4 JOINT EVALUATION
Kenya Certificate of Secondary Education

CHEMISTRY

Paper 2

July/August 2016

Time : 2 Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided.
- Sign and write the date of examination in the spaces provided.
- Answer all questions in the spaces provided in the question paper.
- Mathematical tables and silent calculators may be used.
- All working must be clearly shown where necessary.
- Candidates should check the question paper to ascertain that all pages are printed.
- Use English when answering the questions.

For Examiner's Use Only

Question	Maximum score	Candidate's score
1	15	
2	14	
3	11	
4	11	
5	14	
6	15	
Total Score	80	

1. In an experiment conducted at the Belgut High Achievers Academy 40cm^3 of 0.6M potassium hydroxide and 40cm^3 of 0.6M hydrochloric acid both at 23°C were mixed and stirred continuously with a thermometer. The temperature of the product was recorded after every 20 seconds to achieve the highest temperature. Thereafter the temperature of the solution was again recorded for another two minutes.

a) i) Why was the solution mixture stirred? (1 mark)

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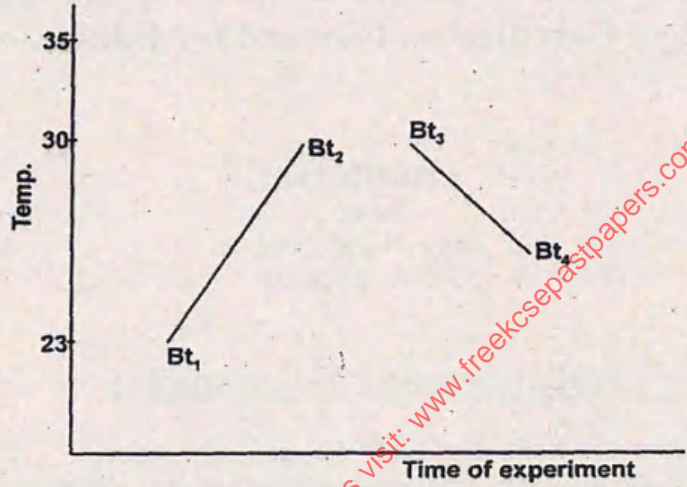
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ii) Write an ionic equation to show the reaction that occurred. (1 mark)

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iii) The sketch below was obtained when the temperature of the mixture was plotted against time of the experiment.



I. Use the sketch to show how the highest temperature reached could be determined. (on the curve) (3 marks)

II. Explain the curve with respect to the part marked Bt_1 and Bt_2 (2 marks)

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Bt_3 and Bt_4 (2 marks)

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iv) Given that the initial temperatures of the two solution was 19.4°C and the highest was 30.70 . Calculate

I. Heat change for reaction (specific heat capacity of $= 4.2\text{Jg}^{-1}\text{k}^{-1}$ and the density of the solution $= 1.0\text{gcm}^{-3}$) (1 mark)

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II. The molar heat of neutralisation of potassium hydroxide. (2 marks)

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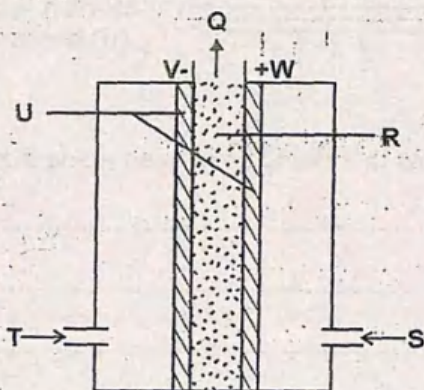
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b) On the grid provided below draw an energy level diagram to show the reaction between HCl and KOH. (3 marks)



2. a) The diagram below is a sketch of a fuel cell. Study it carefully so as to answer the questions that follow.



i) Write an equation for the reaction that occurs at Anode : (1 mark)

.....

Cathode (1 mark)

ii) Explain why
I. fuel cell is better than dry cell. (1 mark)

II. Fuel cell is not as good as a secondary cell. (1 mark)

iii) State the material labelled U and its two uses. (2 marks)

iv) Label correctly the parts marked. (2 marks)

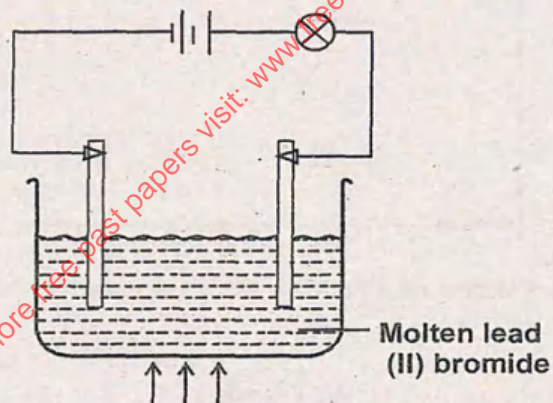
R

S

T

Q

b) The apparatus set below was used in an experiment to electrolyse molten lead (II) bromide.



i) State and explain three observations that could have been made during this experiment. (3 marks)

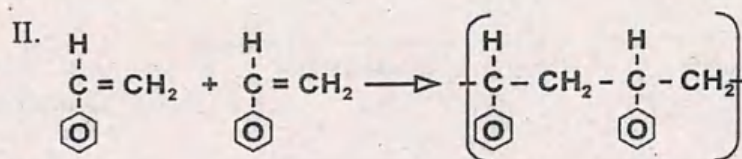
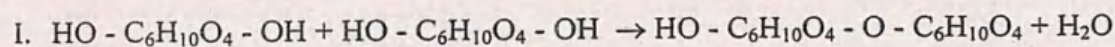
ii) A current of 0.8A was poured through the electrolyte for 100 minutes. Calculate the volume of gas that was collected at s.t.p. (MGV = 22.4dm³) (3 marks)

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3. a) Study the two equations below in order to answer the questions thereafter.



ii) State the type of polymerisation in each reaction. Explain. (3 marks)

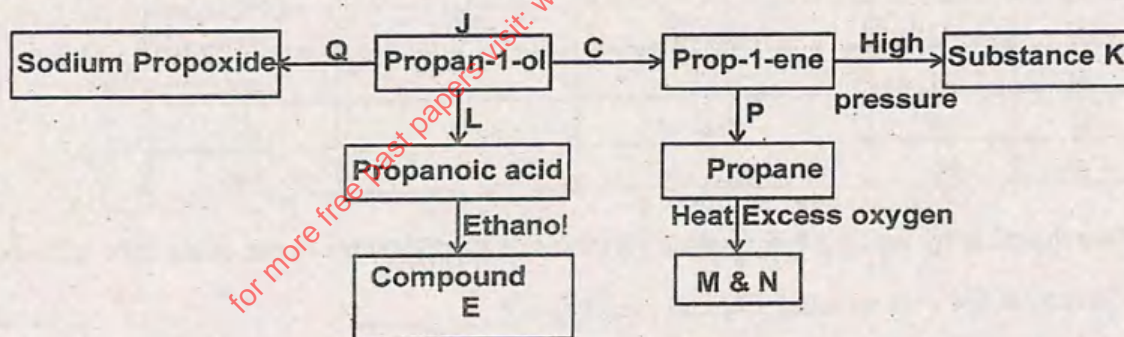
I.

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II.

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b) The reaction scheme below shows several steps of reactions starting from alkanol J.



i) State the reagents required for process L to take place. (2 marks)

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ii) State two conditions necessary for process C in the flow chart. (2 marks)

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iii) I. Write an equation to show the formation of compound E. (1 mark)

II. Reaction between propan-1-ol and Q. (1 mark)

iv) Other than boiling and melting point describe two physical methods that can be used to distinguish propan-1-ol from hexan-1-ol. (3 marks)

v) Draw and name the isomers of $C_4H_{10}O$ (3 marks)

1. a) Use the information in the table in order to attempt the questions that follow. The letters used do not represent the actual symbols of the elements.

Element	Atomic no.	Melting point of element	Formula of chloride	M.P of chloride
A	11	98		801
B	12	650		715
C	14	1410		-70
D	16	113		-80
E	20	851		780

i) Complete the table by writing the possible formulae of the chlorides in the space left. (2½ marks)

ii) Which elements are non-metals? Explain your answer. (2 marks)

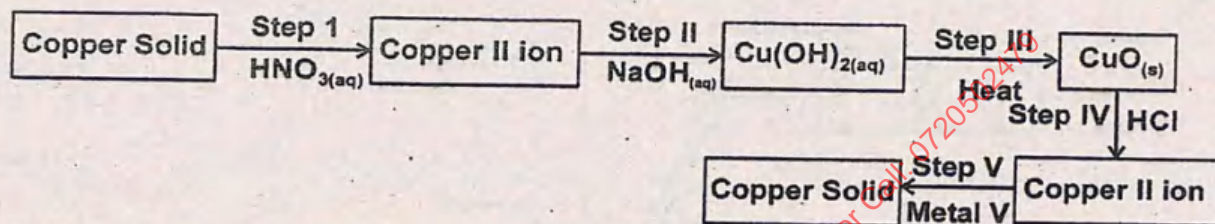
iii) Write the formula of the compound formed when A reacts with D. (1 mark)

iv) Explain why the melting point of the chloride of A is higher than that of C. (2 marks)

v) What is the oxidation state of C in its chloride? (1 mark)

vi) Explain the electrical conductivities of A and A chloride. (1½ marks)

5. The flow chart below shows a sequence of chemical reactions starting with copper. Study it so as to answer the question thereafter.



a) Assuming that 4M HNO₃ was added to 0.4g of copper powder in step I.

i) State and explain two observations that were made as the reaction continued. (3 marks)

ii) Write an ionic equation to show what took place in step I. (1 mark)

iii) Explain why it is not advisable to use dilute HCl in place of dilute HNO₃ in this experiment. (2 marks)

iv) Calculate the volume of 4M nitric (V) acid that was required to react completely with 0.4g of copper. (Cu =64, H=1, N=14, O =16) (3marks)

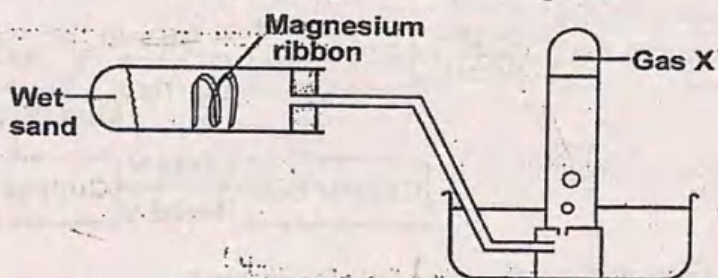
b) Name the type of reaction that took place in step

III

V

c) Give three reasons why copper is largely used electrical works. (3marks)

6. The set up below was used to prepare and collect gas X.



a) Describe a chemical test for gas X. (2marks)

b) Identify one mistake in the set up. (1 mark)

c) Why is magnesium cleaned before placing in the test tube? (1mark)

d) Describe the changes that took place in the test tube during the reaction. (2marks)

e) Write an equation for the changes which took place in the test tube. (1marks)

f) State two industrial uses of substance X. (2marks)

g) State and explain the precautions that need be taken during this experiment. (2marks)

h) 72cm^3 of gas X were collected at 15°C and 760mmHg pressure. (MGV = 22.4dm^3 , Mg=24)

i) Calculate the volume of gas X at s.t.p. (2marks)

ii) Calculate the mass of magnesium ribbon used (Mg=24) (2marks)