



MANGU HIGH SCHOOL

233/3
CHEMISTRY
PAPER 3
PRACTICAL
JULY 2015
TIME: 2½ HOURS

NAME: _____

ADM NO: _____ CLASS: _____

Kenya Certificate of Secondary Education
Mock Examinations
Chemistry
Paper 3
Practical
2 ½ Hours.

- Write your name and Adm. No. in the spaces provided above.
- Answer **ALL** the questions in the spaces provided in the question paper.
- You are **NOT** allowed to start working with the apparatus for the first 15 minutes of the 2¼ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.
- All working **MUST** be clearly shown where necessary.
- Mathematical tables and electronic calculators may be used.

For Examiner's Use Only

Question	Max. Score	Score
1	23	
2	12	
3	5	
Total Score	40	

This paper consists of 7 printed pages.
Make sure that all the pages are printed and that no page is missing.

Turn Over

1. You are provided with:-

- 5.0g of Solid T. in a boiling tube
- Solution Q, 0.3M solution of sodium hydroxide.

You are required to determine:

- Solubility of solid T.
- The number of moles of water of crystallization in solid T

Procedure I

- Fill the burette with distilled water.
- Place solid T in the boiling tube.
- Transfer 4cm^3 of distilled water from the burette into the boiling tube containing solid T. Heat the mixture while stirring with the thermometer to a temperature of 80° .
- Allow the solution to cool while stirring with the thermometer. Record the temperature at which crystals start to form in the table I below.
- Add a further 2cm^3 of distilled water from the burette to the mixture. Repeat the procedure (iii) and (iv) above and record the crystallization temperature. Complete the table I below by adding the volumes of distilled water as indicated.
(Preserve the contents of the boiling tube for procedure II)

TABLE I

Volume of distilled water in boiling tube	Crystallization temperature	Stability of solid T in g / 100g water
4		
6		
8		
10		

(6 marks)

2. You are provided with solid E. You are required to carry out the tests on the solid and record your observations and inferences in the space provided
- i) Place a half spatula of solid E in a dry test tube, heat gently then strongly. Test for any gas produced using a litmus and wooden splint

Observations	Inference

(1 mark)

(1 mark)

- ii) To the remaining solid add about 10cm³ of distilled water and divide the resulting solution into 2 portions

Observations	Inference

(1 mark)

(1 mark)

- iii) To the first portion, add 3 drops of potassium iodine solution

Observations	Inference

(1 mark)

(1 mark)

- iv) To the second portion add 5cm³ of dilute hydrochloric acid and warm. Leave it to cool and filter

Observations	Inference

(1 mark)

(1 mark)

- v) To one portion, add sodium hydroxide drop-wise until in excess

Observations	Inference

(1 mark)

(1 mark)

- vi) To 2nd portion, add aqueous ammonia drop-wise till in excess

Observations	Inference

(1 mark)

(1 mark)

3. You are provided with solid W. Carry out the following tests

- a) Place all of solid W in a boiling tube. Add about 20cm³ of distilled water and shake well. Divide the solution into five separate test tubes

Observations	Inference

(½ mark)

(½ mark)

- b) To the first portion of solution W, add a spatula full of sodium carbonate solid

Observations	Inference

(½ mark)

(½ mark)

- c) To the second portion of solution W, add a few drops of universal indicator and test the PH

Observations	Inference

(½ mark)

(½ mark)

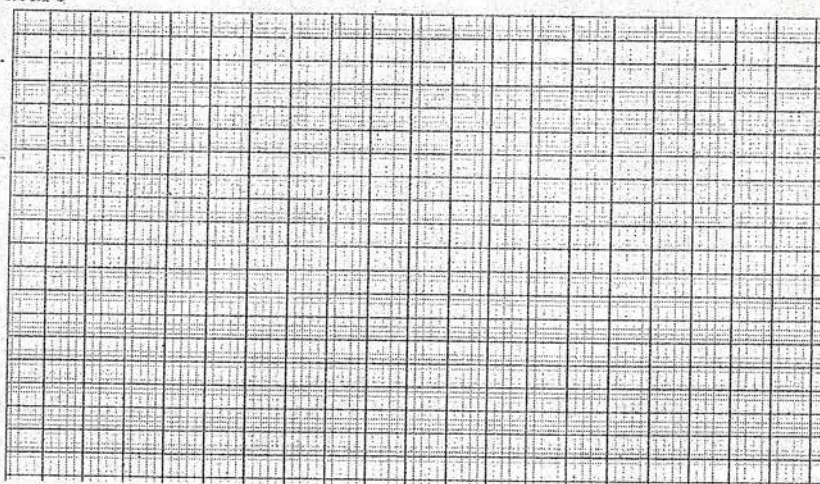
- d) To the third portion of solution W, add 2cm³ of ethanol followed by 2 drops of concentrated Sulphuric (VI) acid

Observations	Inference

(1 mark)

(1 mark)

- a) On the grid provided, plot a graph of solubility of solid T (y-axis) against crystallization temperature (3 marks)



From the graph determine

- i) Solubility of T at 55°C (1 mark)
- ii) The temperature at which 80g of T dissolve in 100g of water (2 marks)

Procedure II

- Transfer the contents of the boiling tube in procedure I to a clean 250ml volumetric flask. Add distilled water to the mark. Label the resulting solution T
- Fill the burette with solution T. Pipette 25cm^3 of Q into a clean 250ml conical flask. Add 3 drops of phenolphthalein indicator
- Titrate T against Q to an accurate end point. Record your results in the table II below
- Repeat the experiment two more times and complete the table II below

Table II

	I	II	III
Final burette reading cm^3			
Initial burette reading cm^3			
Volume of T used cm^3			

Calculate the:-

- i) Average volume of solution T (1 mark)
- ii) Number of moles of sodium hydroxide solution Q used (1 mark)
- iii) Number of moles of solution T in the titre volume given that the formula of solid T is $\text{H}_2\text{D} \cdot x\text{H}_2\text{O}$ (1 mark)
- iv) The relative formula mass (RFM) of solid T (3 marks)
- v) Determine the value of x in the formula given that the RAM of D is 88. (O = 16, H = 1) (1 mark)