

Name..... Adm. no
School: Class.....
Candidate's Sign..... Date:



233/3
CHEMISTRY
PAPER 3
(PRACTICAL)
TIME: 2 ¼ HOURS

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

Chemistry
Paper 3
Practical

INSTRUCTIONS TO CANDIDATES

- Write **your name** and **index number** in the spaces provided above
- **Sign** and **write** the date of examination in the spaces provided.
- Answer **all** 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 2 ¼ hours allowed for this paper. This time is to enable you to **read** the questions 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	Maximum Score	Candidate's Score
1.	20	
2.	8	
3.	12	
TOTAL	40	

This paper consists of 5 printed pages . Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

1. **You are provided with:**

Metal carbonate, MCO_3 , solid **Q**

2M hydrochloric acid, solution **P**

Sodium hydroxide, solution **R** containing 40g per litre of solution.

You are required to determine the relative atomic mass of metal **M**

PROCEDURE

Measure accurately 100cm^3 of solution **P** into a clean 250cm^3 conical flask and add all the 4.69g of solid **Q**, (MCO_3). Shake well and wait for effervescence to stop. Label the resulting solution as S1.

Pipette 25cm^3 of solution **R** into a conical flask and add 2-3 dropped of phenolphthalein indicator.

Fill a burette with solution S1 and titrate against the solution **R** until the end point.

Record your results in the table below. Repeat the procedure to fill the table

Table 1

	I	II	III
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution S1 used (cm^3)			

Calculate

(i) Average volume of S1 used (1mk)

.....
.....

(ii) Moles of sodium hydroxide, solution **R** used (2mks)

(Na=23, O=16, H=1)

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.....

(iii) Moles of Hydrochloric acid, solution S1 in average volume used. (2mks)

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.....

(iv) Moles of Hydrochloric acid, solution S1 in 100cm^3 of solution (2mks)

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.....

(v) Moles of hydrochloric acid in 100cm^3 of the original solution **P** (2mks)

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.....

(vi) Moles of Hydrochloric acid, solution P, that reacted with solid Q.MCO₃ (2mks)

.....
.....

(vii) Moles of MCO₃ that reacted (2mks)

.....
.....

(viii) The relative formula mass of MCO₃ (2mks)

.....
.....

(ix) The atomic mass of M (1mk)

.....

2. You are provided with solid X. Carry out the tests below and record your observations and inferences in the table below.

(a) Place one spatula endful of solid X in a test-tube and add about 10cm³ distilled water. Shake well and use for test (i) below.

(i) Test 2cm³ of the solution in the test tube with red litmus paper and blue litmus paper.

Observations	inferences
1mk	1mk

(ii) To 2cm³ of the solution in the test tube, add spatula endful of sodium hydrogen carbonate

Observations	inferences
1mk	1mk

(iii) To 2cm³ of the solution, add three drops of acidified potassium Manganate VII solution.

Observations	inferences
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1mk	1mk
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(iv) Place about 4cm³ of ethanol in a test tube and add 2 drops of concentrated sulphuric acid then add a spatula endful of solid X. warm the mixture carefully. Shake well and pour the mixture into 20cm³ of water in beaker.

Observations	inferences
1mk	1mk

3. You are provided with solid N. Carry out the tests and record the observations and inferences in the spaces provided

(a) Dissolve one spatula endful of solid N in about 10cm³ of distilled water. Divide the solution into five portions

Observations	inferences
1mk	1mk

(b) To the 1st portion add aqueous NaOH solution dropwise until in excess

Observations	inferences
1mk	1mk

(c) To the 2nd portion add dilute ammonia solution dropwise until in excess

Observations	inferences
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1mk	1mk
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(d) To the 3rd portion add three drops of dilute Sulphuric (VI) acid

Observations	inferences
1mk	1mk

(e) To 4th portion add 3 drops of Lead (II) nitrate solution.

Observations	inferences
1mk	1mk

(f) To 5th portion add 3 drops of Lead (II) nitrate solution and warm the mixture gently

Observations	inferences
1mk	1mk