

Name:..... Index No.:

Candidate's Signature:

Date:

233/3

CHEMISTRY

Paper 3

PRACTICAL

Time: 2 hours 15 Minutes

BUSIA COUNTY JOINT EVALUATION EXAMINATION-2014

Kenya Certificate of Secondary Education

CHEMISTRY

Paper 3

Instructions to Candidates

- ❖ Write your name and index number in the spaces provided above.
- ❖ Sign and write the date of the examination paper.
- ❖ Answer **ALL** the questions in the spaces provided in the question paper.
- ❖ **ALL** working **MUST** be clearly shown where necessary.
- ❖ Mathematical tables and silent electronic calculators may be used.
- ❖ Candidates should check the paper to ascertain that all the pages are printed as indicated and that no questions are missing.

1. You are provided with:-
 Solution A, 0.07M hydrochloric acid
 1g solid B, Calcium hydroxide

You are required to determine the solubility of $\text{Ca}(\text{OH})_2$

Procedure:

Transfer all solid B into a 250cm^3 volumetric flask. Measure accurately using a clean measuring cylinder 50cm^3 of water and transfer this carefully into the volumetric flask. Shake gently and measure a second portion of 40cm^3 water and add this to the resulting solution in the volumetric flask. Filter the solution into a beaker and label this solution D.

Place solution A in the burette, pipette 25.0cm^3 of solution D into a 250cm^3 conical flask and titrate using methyl orange indicator. Record your result in table below and repeat the titration carefully to obtain consistent results.

Table	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of A used (cm^3)			

(4mks)

Calculate:

- (a) Volume of solution A used.

(1mk)

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- (b) Number of moles of the solution A reacted.

(1mk)

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(c) Number of moles of solution D in the 25cm^3 (2mks)

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(d) Calculate mole of solution D in the 90cm^3 of the solution D. (1mk)

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(e) Calculate the mass of calcium hydroxide that dissolved in 90cm^3 of water. (2mks)

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(f) Determine the solubility of calcium hydroxide at the room temperature. (2mks)

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2. You are provided with:-

- Solution Y contained 0.2M copper (II) sulphate per litre of solution
- Solid Z

You are required to determine the heat evolved when one mole of solution Y react with solid Z.

Procedure

Measure 40cm^3 of solution y and place it into insulated 50cm^3 plastic beaker, stir the solution with the help of the thermometer and record its temperature after every half minute for $1\frac{1}{2}$ minutes.

After exactly 2 minutes add all the solid Z provided and continue stirring the mixture while recording the temperature of solution and complete the table below.

Table

Time (min)	½	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7
Temp ⁰ c				X										

(b) (i) On the graph paper provided. Plot a graph of temperature against time. (4mks)

(ii) From your graph, determine the maximum temperature change. (1mk)

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(c) Given that density of the solution is 1 g/cm³, determine the quantity of heat evolved when the 40cm³ of solution Y is reacted completely with solid Z. Specific heat capacity of solution = 4.2 Jg⁻¹K⁻¹. (2mks)

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(d) (i) Given that solid Z is zinc powder. Write an ionic equation of the reaction which occurs (1mk)

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(ii) Determine the moles of copper (II) ions used up in the reaction. (1mk)

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(iii) Determine the amount of heat that would be evolved of one mole of copper (II) ions were used up. (1mk)

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3. You are provided with substance K, carry out the test below and record your observations and deductions in the table below.

(a) Scoop a little of solid K with a clean metallic spatula and place it at the hottest part of a non-luminous flame.

Observation	Deductions
(1mk)	(1mk)

(b) Add about 10 cm³ of distilled water to the remaining solid K. divide the resulting mixture into 4 portions.

(i) To the 1st portion add 3 drops of acidified K₂Cr₂O₇

Observation	Deductions
(1mk)	(1mk)

(ii) To the 2nd portion add 3 drops of bromine water and warm.

Observation	Deductions
(1mk)	(1mk)

(iii) Add 2-3 drops of universal indicator to the 3rd portion and determine the pH of the solution

Observation	Deductions
(1mk)	(1mk)

(iv) To the 4th portion add a spatula of sodium carbonate.

Observation	Deductions
(1mk)	(1mk)

(c) Dissolve one spatula endful of solid L in about 10cm³ of distilled water. Divide the solution in 3 portions.

(i) To the 1st portion add NaOH_(aq) dropwise until in excess.

Observation	Deductions
(1mk)	(1mk)

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

Observation	Deductions
(1mk)	(1mk)

(iii) To the 3rd portion add 2-3 drops of lead (II) nitrate solution and warm.

Observation	Deductions
(1mk)	(1mk)