KENYA NATIONAL EXAMINATION COUNCIL
KCSE, 2014

CHEMISTRY PAPER 3
ANALYSIS

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3.5.3 Chemistry Paper 3 (233/3)

Chemistry (233/3) is a practical paper which tests candidates ability to manipulate apparatus, mak accurate records, interpret data/information and make logical conclusions. The paper of 2014, had thre questions. Question 1 was on quantitative analysis while questions 2 and 3 were on qualitative analysis Question 1 and question 3 were performed quite well. Question 2 on inorganic chemistry was performe poorly and is briefly discussed below.

Question 2

You are provided with substance **P**. Carry out the tests below and write your observations and inferences in the spaces provided.

(a) Describe the appearance of substance **P**. (1 mark)

(b) Place about one-third of substance **P** in a dry test-tube and heat it strongly.

Observations	**Inferences**
(1 mark)	(1 mark)

(c) Place the remaining amount of substance **P** in a boiling tube. Add about 10 cm^3 of distilled water and shake well. **Retain** the mixture for tests in (d) below.

Observations	**Inferences**
(1 mark)	(1 mark)

(d) Use about 2 cm^3 portions of the mixture obtained in (c) for tests (i) to (iii) below.

(i) Add two to three drops of aqueous barium nitrate to the mixture.

Observations	**Inferences**
(1 mark)	(2 marks)

(ii) Add five drops of dilute nitric(V) acid to the mixture.

Observations	Inferences
(1 mark)	(1 mark)

(iii) Add to the mixture, aqueous sodium hydroxide dropwise until in excess.

Observations	Inferences
(1 mark)	(1 mark)

(e) Give the formula of the cation and anion present in substance **P**.

Cation: ..... ($\frac{1}{2}$ mark)

Anion: ..... ($\frac{1}{2}$ mark)

The question required the candidates to;
1 Select apparatus that can be used to heat strongly small quantities of substances;
2 Reagents that can be used to carryout specified reactions;
3 Record results /observations;
4 Make interpretations of the results;
5 Draw conclusions from the results.

Weaknesses

1 Candidates did not make accurate observations and if they did, the results were not recorded in the spaces provided.
2 Interpretations made were inaccurate leading to inaccurate conclusions.

Candidates should plan how to proceed with the experiments. Candidates are being advised to make a habit of reading and making accurate planning before they begin to do any of the tasks. Any observation made should be recorded immediately and using scientific language. The fact that they did not score means that they had little or no exposure to practical work. Candidates must be given enough practice in qualitative and quantitative analysis before they can sit for examinations.

Expected response

(a) White crystalline substance.

	Observations	Inferences
(b)	Colourless liquid condenses on the cool parts of T-Tube leaving behind a white solid	Hydrated salt or salt contains water of crystallisation
(c)	Solid dissolves to form colourless solution.	P is soluble in water No coloured ions
(d)	(i) White PPt formed	SO_4^{2-}, SO_3^{2-} or CO_3^{2-} present
	(ii) No effervescence or no bubbles	SO_4^{2-}, present or SO_3^{2-} or CO_3^{2-} absent
	(iii) White PPt	Mg^{2+} present
(e)	Cation	Mg^{2+} or Magnesium ions
	anion	SO_4^{2-} or Sulphate ions

CONCLUSION

Chemistry should be taught practically. Enquiry based approach to teaching and learning is the norm worldwide and Kenya should not be left behind. School heads are requested to ensure that adequate facilities are provided in schools. It is very unfair for some candidates to see some of the common apparatus for the first time during examinations.