

Name Index No.

School.....Candidate's signature

Date

233/2

CHEMISTRY

Paper 2

July/August 2016

Time 2 hours

NTIMA, NYAKI AND MUNICIPALITY CLUSTER EVALUATION - 2016

Kenya Certification of Secondary Education

CHEMISTRY

Paper - 233/2

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.
- KNEC mathematical tables and silent non-programmable electronic calculators may be used.
- All working must be shown.
- Candidates should answer the questions in English

FOR EXAMINER'S USE ONLY

Question	Maximum score	Candidates score
1	12	
2	11	
3	15	
4	10	
5	10	
6	10	
7	12	
<i>This paper consists of 10 printed pages</i>		
<i>Candidates should check the question paper to ensure that all the printed pages are printed as indicated and no questions are missing.</i>		

1. The table below shows part of the periodic table with only a few symbols for elements included. Study it and answer the questions that follows.

							He
						F	
Na			Al	Si		S	
	Ca					Br	

- a) i) Why are elements in the same group as Helium unreactive? (1 mark)

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- ii) Explain why element Na is more reactive than Al. (2 marks)

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- b) What type of structure does the oxide of silicon have? (1 mark)

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- c) Explain how the following compare:

- i) the reaction of F and Br. (2 marks)

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- ii) The atomic radius of Na and S. (2 marks)

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- iii) The boiling point of the chloride of Na with that of S. (1 mark)

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- d) i) X is an element with melting point of 30°C and boiling point of 2440°C . It conducts electricity at room temperature. It forms an oxide which is colourless solid of formula X_2O_3 . Place X in the appropriate location in the periodic table. (1 mark)

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.....
ii) In what - state would you expect X to be at room temperature of 25°C? (1 mark)

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.....
iii) Write the formula of the fluoride of A. (1 mark)

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.....
2. The diagram below shows an arrangement made to prepare and correct nitrogen from air.

a) The piston pushed slowly to the right. Explain. (1 mark)

b) State the function of;

i) concentrated sodium hydroxide solution. (1 mark)

ii) Copper metal. (1 mark)

c) What property of Nitrogen makes it necessary to be collected as shown in the diagram? (1 mark)

d) Nitrogen collected was not pure. Explain. (1 mark)

e) Write the equation for the reaction involving copper metal. (1 mark)

f) When magnesium is heated in air a mixture of two solids are formed.

i) Identify the two solids.

(2 marks)

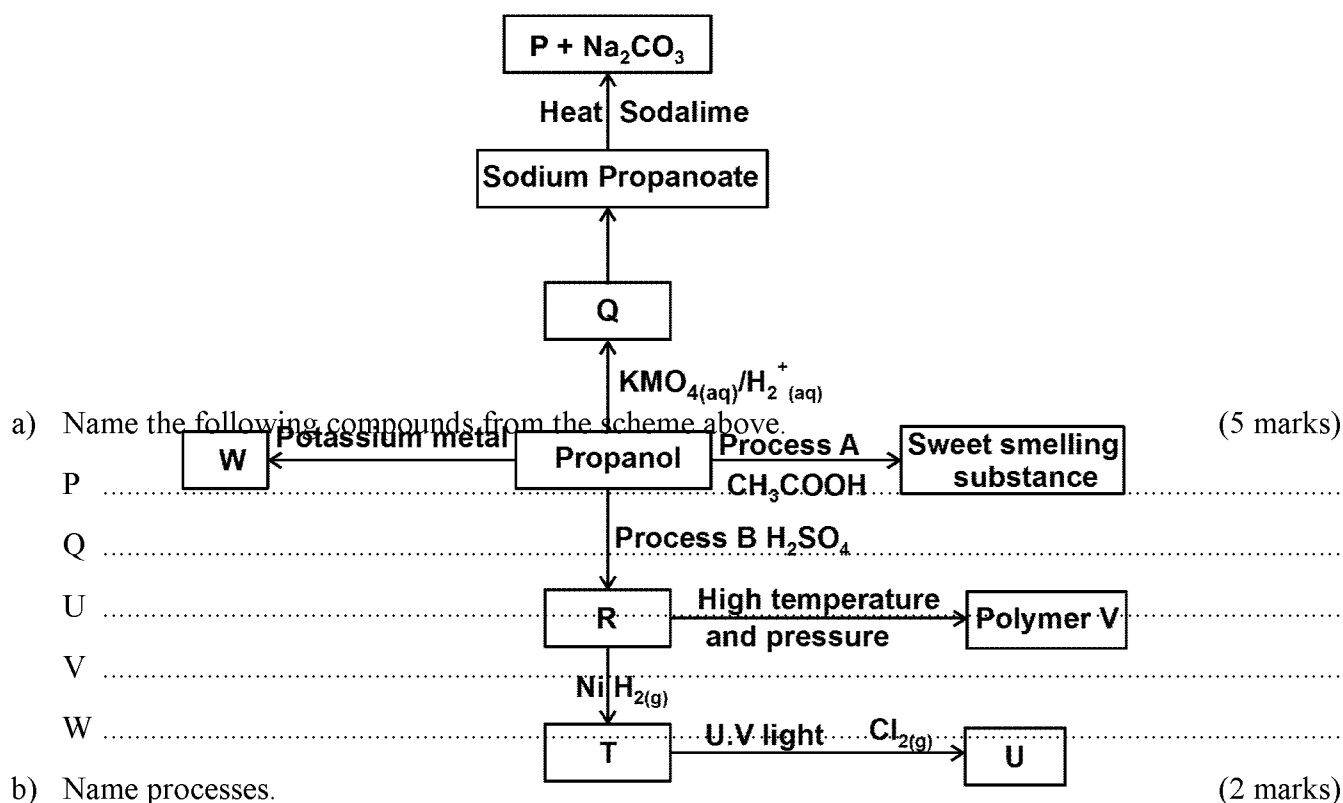
g) Write a balanced chemical equations for the reaction.

(2 marks)

h) Name a method that can be used to obtain larger quantities of Nitrogen from air.

(1 mark)

3. Study the flow chart below and answer the questions that follow.



c) Write type of reagent is required to convert substance Q to sodium propanoate.

(1 mark)

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.....
d) Write a chemical equation for the formation of the sweet smelling compound. (1 mark)

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.....
e) RCOONa and $\text{RCH}_2\text{OSO}_3\text{Na}$ represents two types of cleaning agents.

Which of the two clearing agents is suitable you use when washing with water containing Mg^{2+} ions.
Explain. (2 marks)

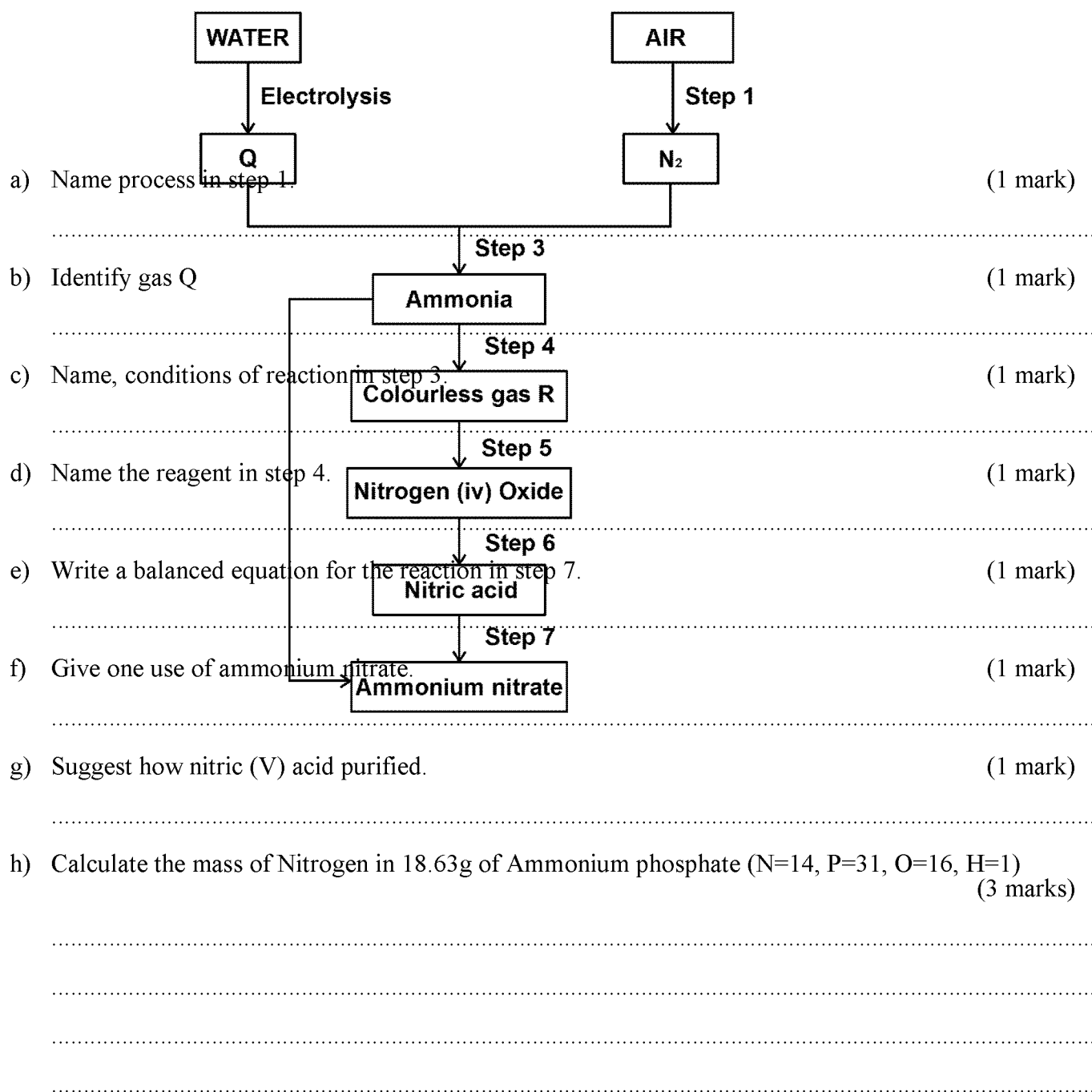
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f) The following is a condensation polymer

i) Write and name the structure of the monomers for the above polymer. (2 marks)

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.....
ii) Name the above polymer (1 mark)

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iii) Give one use of the polymer named in (ii) above. (1 mark)

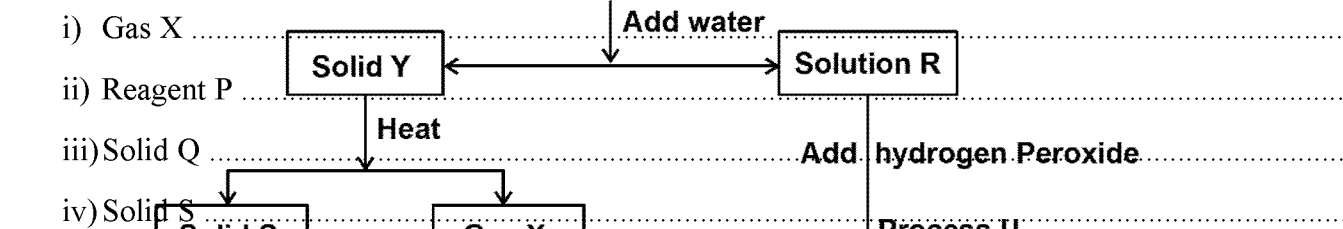
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4. Study the flow chart below and answer the questions that follow.



5. Study the following scheme and follow the questions that follow.

- a) Name the process that can be used to separate solid Y and solution R. (1 mark)

- b) Name Gas. (4 marks)



- c) Name process U. (1 mark)

- d) Write chemical equation leading to the formation of :

- i) Write precipitate of T. (1 mark)

- ii) Solid Q (1 mark)

- e) Suggest the colour of solution R. (1 mark)

- f) Write the formula of substance T. (1 mark)

6. The diagram below represents the blast furnace used for the extraction of iron. Study it and answer the questions that follow.

- a) At which point X, Y and Z would you expect the highest temperature. (1 mark)

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- b) Name two constituents of A. (2 marks)

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- c) What is the main use of the constituents of A in this process. (1 mark)

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- d) Explain the role of limestone in the furnace. (2 marks)

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- e) Name two physical properties that make slag and iron to be separated by the method. (1 mark)

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- f) Give one use of slag. (1 mark)

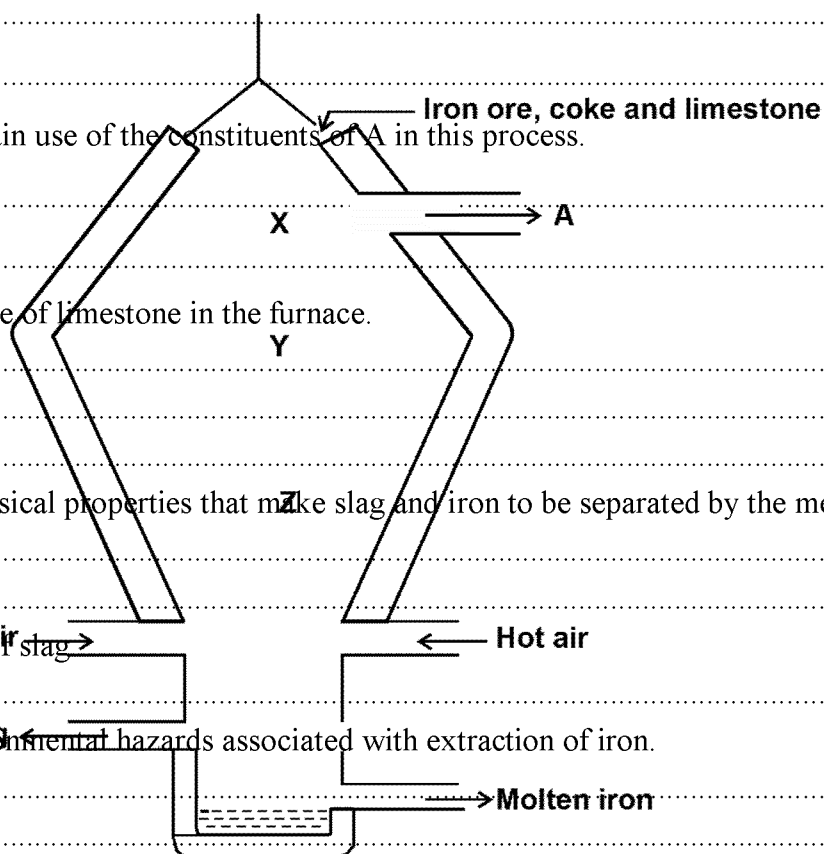
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- g) List two environmental hazards associated with extraction of iron. (2 marks)

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7. The table below shows temperature reached when equal volumes of an alkaline solution of 1.5M concentration was reacted with 0.95M sulphuric (VI) acid each.

- a) On the grid provided, plot a graph of temperature against volume of acid used. (3 marks)



b) From the graph determine:-

Total volume of $\text{H}_2\text{SO}_{4(\text{aq})}$ added (cm^3)	0	5	10	15	20	25	30	35	40
i) the Volume of alkali solution (V ₁) (and) needed to completely react with 30.0 cm ³ of the acid solution.	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Highest temperature reached	23.0	24.0	25.0	26.0	27.0	28.0	28.0	27.0	26.5

(1 mark)

.....

ii) the highest temperature reached. (1 mark)

c) Calculate the heat change (density of solution = 1g/cm^3 , specific heat capacity of solution = $4.2\text{J/g}^\circ\text{C}$) (2 marks)

d) Calculate the molar heat of neutralization reaction. (3 marks)

e) Suppose 0.95M ethanoic acid had been used instead of 0.95M sulphuric (VI) acid, how would the molar heat of neutralization compare? Explain. (2 marks)

