

Name: Index No.

School: Candidate's Sign.

Date:

233/1
CHEMISTRY
PAPER 1
JULY/AUGUST 2011
TIME: 2 HOURS

NDHIWA DISTRICT JOINT EVALUATION TEST

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

Chemistry
Paper 1

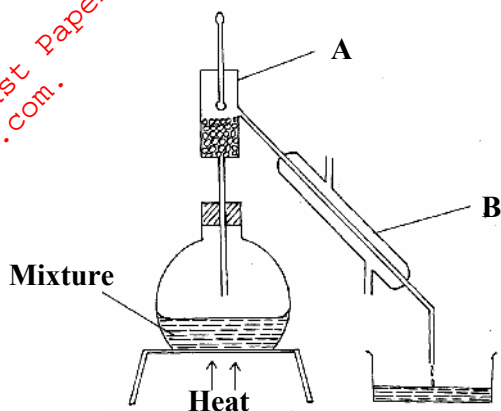
INSTRUCTIONS TO THE CANDIDATES:-

- Write your **name** and **index number** in the spaces provided.
- Answer **all** the questions in the spaces provided.
- Mathematical tables and electronic calculators may be used
- All working **MUST** be clearly shown where necessary.

Question	Maximum score	Candidate's score
1-30	80	

This paper consists of 12 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing

1. The diagram below shows a set-up of apparatus used to separate immisible liquids.



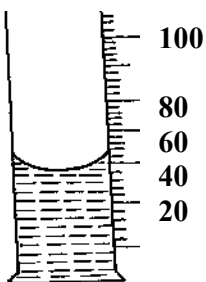
- (a) Name the parts labelled A and B (1mk)
A.....
B.....
- (b) State the function of the part labeled A. (1mk)
.....
- (c) State the property of the mixture that makes it suitable to be separated by the method above. (1mk)
.....

2. Study the information in the table below and answer the questions that follow. The letters do not represent the actual symbols of the elements.

Element	Atomic Number	Melting point ($^{\circ}\text{C}$)
L	11	97.8
M	13	660
R	19	63.7

- (i) Write the formulae of carbonate R and M (1mk)
- (ii) Describe how the carbonate of M can be obtained from a mixture of carbonate R and M.(2mks)
.....
.....
.....
- (iii) R is more reactive than L. Explain (1mk)
.....
.....

3. In an Experiment, concentrated sulphuric acid was put in a beaker and exposed to air for one week as shown below.



- (i) What observation was made after one week . Explain. (2mks)

.....

- (ii) What property of sulphuric acid was being investigated in the experiment. (1mk)

.....

4. a) Define the term solubility. (1mk)

.....

- b) A form four student wanted to determine the solubility of potassium nitrate. He obtained the following results.

Mass of evaporating dish = 15.13g

Mass of evaporating dish and solution. = 36.51g

Mass of evaporating dish and salt = 19.41g

- Use the information above to calculate the solubility of potassium nitrate. (3mks)

5. The table below shows the standard electrode potentials of two elements P and Q.

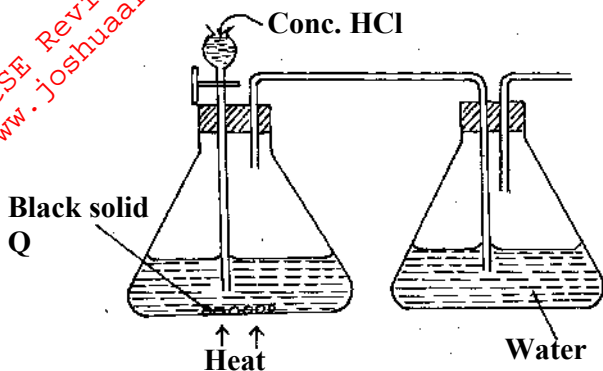
Half reactions	E^θ (v)
$P^{2+}_{(aq)} + 2 e^- \rightarrow P_{(s)}$	-2.37
$Q^{2+}_{(aq)} + 2 e^- \rightarrow Q_{(s)}$	-0.402

- (i) Draw a well labelled diagram of a cell that could be constructed from the pair of elements.(2mks)

(ii) Calculate the e.m.f of the cell above.

(1mk)

6. The diagram shows an incomplete set-up for the laboratory preparation and collection of chlorine gas. Study it and answer the questions that follow.



(a) Complete the set-up to show how dry chlorine gas is collected.

(2mks)

(b) Name substance Q.

(1mk)

7. If aqueous lead (II) nitrate is added to aqueous solution potassium iodide, a bright yellow precipitate is formed.

(i) Write down the formula of the precipitate formed.

(1mk)

(ii) Write an ionic equation for the reaction above.

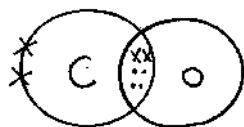
(1mk)

8. Zinc carbonate decomposes on heating producing a gaseous product and a residue. What volume of the gaseous product at s.t.p is produced from 2.5 g of the carbonate? (Zn = 65, C=12, O=16 M.G.V at s.t.p = 22400cm³)

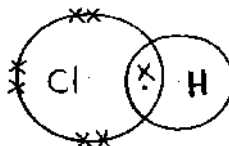
(3mks)

9. Identify the type of bond formed in (i) and (ii) .

(2mks)



(I)

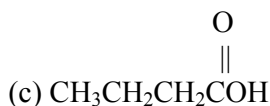
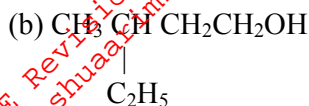
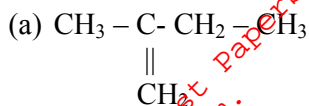


(II)

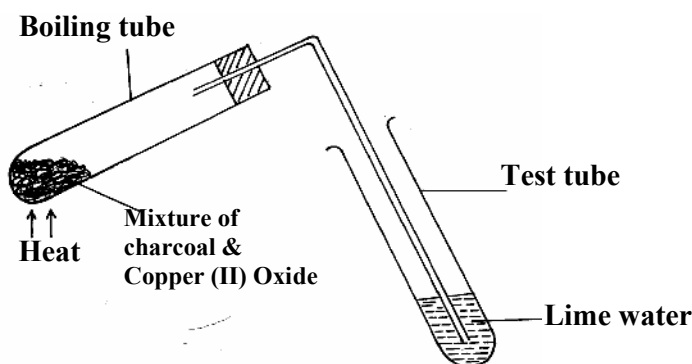
(I).....

(II).....

10. Give the systematic names of the following compounds. (3mks)



11. The set up below was used to investigate a chemical property of carbon. Study it and answer the questions that follow.



(i) What observations were made on heating the mixture. (2mks)

.....
.....

(ii) What is the industrial application of carbon in terms of property investigated above. (1mk)

.....
.....

12. In an experiment, a few drops of concentrated nitric (IV) acid were added to aqueous Iron (II) sulphate in a test tube. excess sodium hydroxide solution was then added to the mixture.

(a) State the observations that were made when:

(i) Concentrated nitric (V) acid was added to aqueous Iron (II) sulphate (1mk)

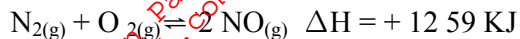
.....

(ii) Excess sodium hydroxide was added to the mixture. (1mk)

.....

(b) Write an ionic equation for the reaction that occurred in a(ii) above. (1mk)

13. Consider the reaction represented by the equation:

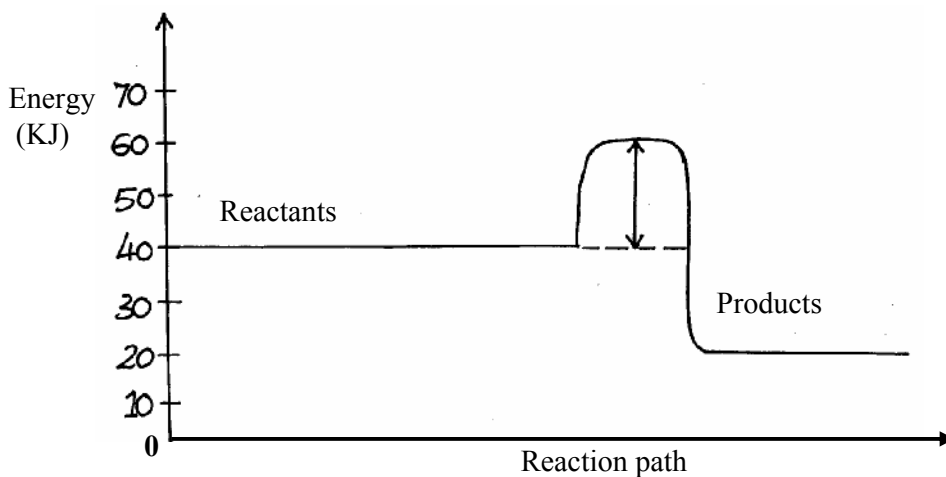


Explain the effect of the following on the reaction;

(a) An increase in pressure (1mk)

(b) Increase in temperature (2mk)

14. Study the energy level below and answer the questions that follow.



(i) State and explain whether the reaction represented in the diagram is endothermic or exothermic. (1mk)

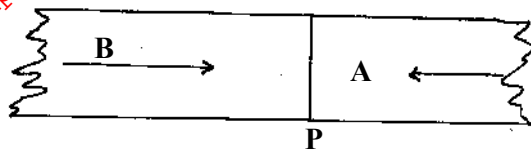
(ii) From the diagram, determine;
I the activation energy (1mk)

II enthalpy of reaction (1mk)

15. Explain why when heating substances with non-luminous flame, tubes should not be placed very close to the top of the chimney. (2mks)

16. State Graham's law of diffusion. (1mk)

- (b) Two gases A and B diffuses from two opposite ends of the glass tube as shown. After 12 seconds gas B was detected at point P and A was detected 4 seconds later



Calculate the relative molecular mass of A given that the relative molecular mass of B is 2. (2mks)

17. Starting with copper metal, describe how a sample of crystals of copper (II) chloride may be prepared in the laboratory. (3mks)

.....

18. Thorium ${}_{90}^{232}\text{Th}$ undergoes two consecutive alpha decays followed by two consecutive beta decays

to form the nuclide ${}_{y}^{x}\text{Ra}$. Identify the values of x and y (3mks)

.....

19. Explain why the reaction between 1g of calcium carbonate and 1M hydrochloric acid is faster than the reaction between 1 g of calcium carbonate and 1M butanoic acid. (2mks)

.....

20. A hydrocarbon gas Y in which the percentage of hydrogen by mass is 14.3% occupies a volume of 2.24dm^3 at s.t.p and weighs 7g

(i) Determine the empirical formula of y. (C= 12,H=10) (1 ½ mks)

(ii) Give the structural molecular formula of Y. (1 ½ mks)

21. When magnesium was burnt in air, a solid mixture was formed. On addition of water to the mixture a Gas which turned moist red litmus paper blue was evolved. Explain these observations. (2mks)

.....

22. In an experiment to prepare nitrogen (I) oxide, ammonium nitrate was gently heated in a flask.

(a) State and explain how the gas collected. (1mk)

.....

(b) A sample of the gas was tested with damp blue and red litmus papers. What observations were made? (1mk)

.....

23. Complete the table below. (2mks)

Element	Latin Name	Symbol
_____	Plumbum	_____
Copper	_____	Cu
Potassium	_____	K

24. The grid below is part of the periodic table. Use it to answer the questions that follow. (The letters do not represent the actual symbols of elements.)

					R	S	
N	Q					T	U
P							

(a) Indicate in the grid the position of an element represented by letter V, whose atomic number is 14. (1mk)

.....

(b) Select a letter which represents a monoatomic gas. (1mk)

.....

(c) write an equation for the reaction between Q and T (1mk)

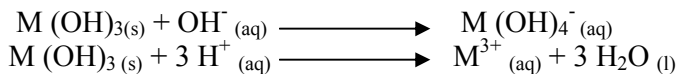
25. In an Experiment, dilute hydrochloric acid was added to sodium hydroxide solution drop – wise. The concentration of sodium hydroxide was noted at regular time intervals.

(i) Sketch a graph of concentration (y-axis) against time interval to show how the concentration of sodium hydroxide changes. (2mks)

(ii) Explain the shape of the curve sketched above. (1mk)

.....

26. A compound whose general formula is $M(OH)_3$ reacts as shown by the equations below.



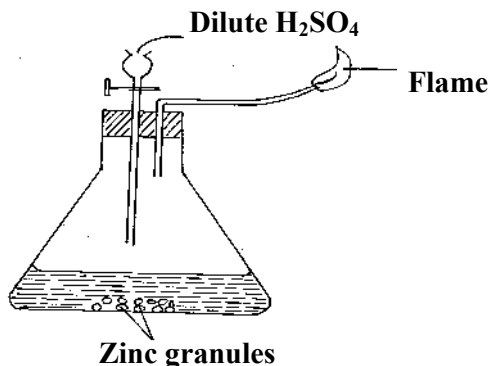
(i) what name is given to the compounds which behave like $M(OH)_3$ in the two reactions above? (1mk)

.....

(ii) name two elements whose hydroxides behave like that of M. (1mk)

.....

27. Below is a set-up of apparatus used to prepare hydrogen gas in the laboratory study it and answer the questions that follow.



(a) Write the chemical equation for the two reactions taking place in the above set up. (2 mks)

(b) State the chemical test for hydrogen gas. (1mk)

.....
.....

28. Draw a well labelled diagram to illustrate how copper metal is purified. (3mks)

29. (a) What are alkali metals. (1mk)

.....
.....

(b) Explain why potassium atom is larger than Sodium atom. (1mk)

.....
.....