

NAME..... INDEX NO:.....
CANDIDATE'S SIGNATURE:..... DATE.....

233/1

**CHEMISTRY
THEORY**

Paper 1

JULY/AUG. 2010

Time: 2 HRS

BUTERE DISTRICT JOINT EVALUATION TEST – 2010
Kenya Certificate of Secondary Education (K.C.S.E)

233/1

**CHEMISTRY
THEORY**

Paper 1

JULY/AUG. 2010

Time: 2 HRS

INSTRUCTIONS TO CANDIDATES

- Write your Name, School and Index No. in the spaces provided.
- Sign and write the date of examination 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.
- Mathematical tables and silent electronic calculators may be used.

EXAMINERS USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	10	
2	11	
3	12	
4	12	
5	13	
6	10	
7	12	
Total	80	

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

1. a) Explain the observation that is made when excess chlorine gas is bubbled through a colourless solution of potassium iodide. (2mks)

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.....

- b) Give the name to the types of reaction observed in (a) above. (1mk)

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2. A form four student heated copper (II) nitrate solid to a constant mass. Given a wooden splint and wet litmus paper state the observations made and the products formed.

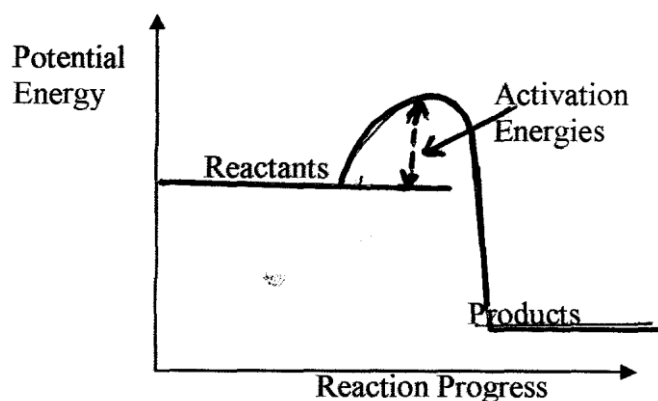
- a) Observations (1 ½ mk)

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- b) Products formed. (1½ mk)

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.....

3. Study the energy level graph for a reaction in which a catalyst was used.



- a) Name the type of reaction shown above. (1mark)

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- b) Sketch on the graph the shape of the graph obtained if a catalyst is not used. (1mark)

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- c) Explain the difference in the two curves above. (1mark)

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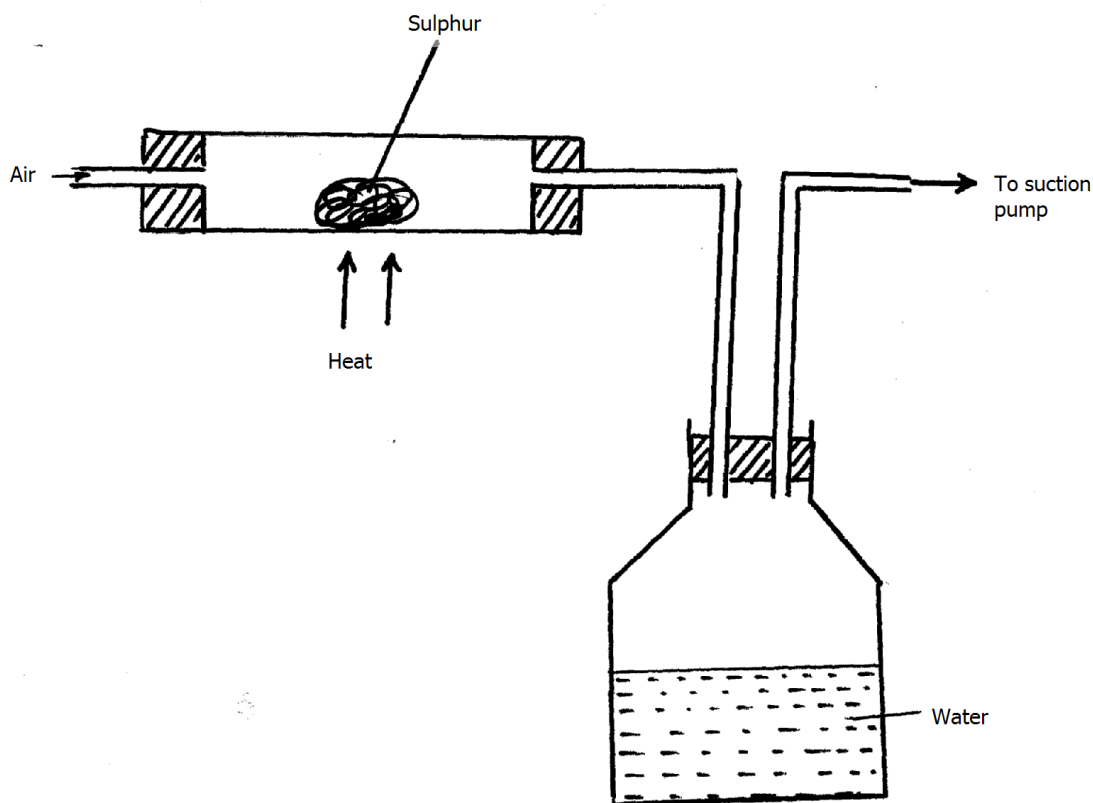
4. a) State any two disadvantages of hard water. (2mks)

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- b) Explain why soap does not lather with water containing large amounts of sodium chloride yet sodium ions do not cause water hardness. (1mk)

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5. The apparatus below was used to prepare sulphurous acid in the laboratory from its anhydride. Study it and answer the questions that follow.



- a) Identify any one mistake in the set-up. (1mk)

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- b) What would be observed if the above solution is passed through:

- i) Iron (II) sulphate solution. (1mk)

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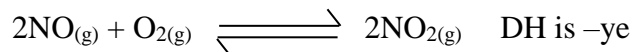
- ii) Potassium dichromate solution. (1mk)

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6. Using equations explain why silicon chloride and phosphorus chloride fume in air. (3mks)

.....

7. The equation below shows a reaction at equilibrium.



a) What would be the effect of raising the temperature? (1mk)

.....
.....

b) What would be the effect of increased pressure? (1mk)

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.....

8. The gas methylene (CH_5N) and ammonia (NH_3) are closely related and share similar properties. Ammonia and methylene can be represented as R-NH_2 .

a) What does R represent in: (1mk)

Ammonia.....

Methylene.....

b) What would be the observed effect of methylene on:

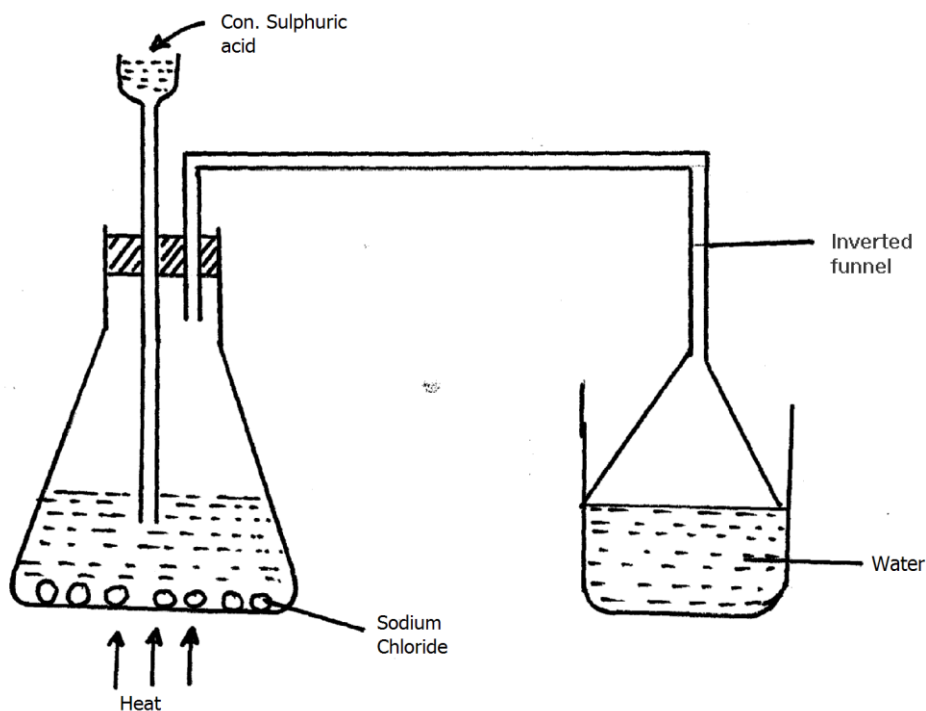
i) Phenolphthalein (1mk)

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ii) Hydrogen chloride gas. (1mk)

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9. The diagram below shows the laboratory preparation of hydrochloric acid.



a) Write the equation for the reaction between sodium chloride and concentrated sulphuric acid. (1mk)

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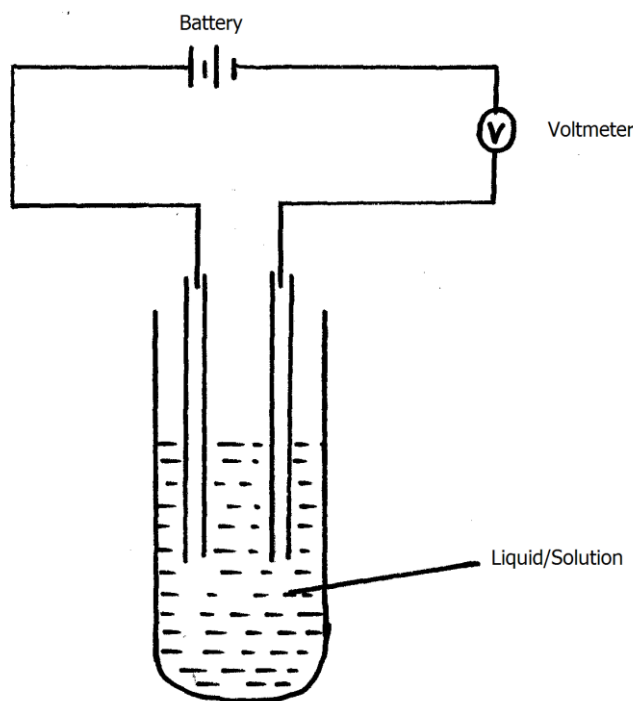
b) Give two reasons why an inverted funnel is used instead of delivery tube. (2mks)

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10. 100cm^3 of oxygen diffuse through an opening in 10 seconds where as 150cm^3 of an unknown gas x diffuse through the same opening in 12 seconds. Calculate the molecular of gas x. (O = 16) (3mks)

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.....

11. Using the set-up below an electric current was passed through pure water, dilute sulphuric acid and ethanoic acid in turns.



The following is a list of observations that were made. Not in order. No deflection on voltmeter, small deflection and a large deflection.

For each liquid give the correct observation and explain.

i) Ethanoic acid. (1mk)

.....
.....

ii) Water (1mk)

.....
.....

iii) Dilute sulphuric acid (1mk)

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12. a) Why is it not advisable to use dilute nitric acid and zinc to prepare hydrogen gas? (2mks)

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b) State any one important use of hydrogen gas. (1mk)

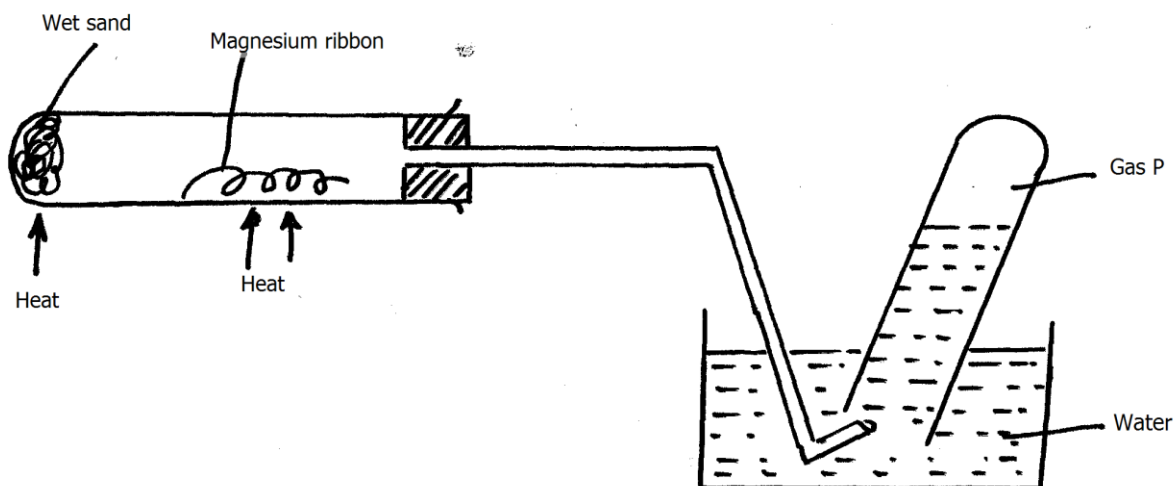
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13. Calculate the mass of marble chips that produces 11.2cm³ of carbon (IV) oxide at r.t.p. When reacted with dilute hydrochloric acid. (molar gas volume = 24.0dm³, C = 12, O = 16, Ca = 40) (3mks)

14. State and explain the difference in melting point between calcium and potassium. (Ca = 20, K = 19) (3mks)

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15. The set-up below can be used to study the reaction of magnesium and steam.



a) Name gas P. (1mk)

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b) How would you expect copper to behave compared to magnesium in the combustion tube? (1mk)

.....

c) Write the equation for the reaction between magnesium and steam.

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16. A student added excess zinc powder to 50cm³ of 0.2m CuSO₄ solution and there was arise in temperature of 15⁰C.

i) Explain why excess zinc powder was used. (1mk)

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ii) Calculate the molar heat of displacement of copper (II) ions
(Density = 1g/cm³, s.h.c = 4.2J/g/k) (2mks)

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17. a) Write two differences between chemical and nuclear equations. (1mk)

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- b) A radio active nuclide was found to give 135 counts per minute in a G.M. tube if the background radiation is 15 counts per minute and its half life is 10 years. Calculate its activity after 40 years. (2mks)

18. List three observable changes made when hydrated copper (II) sulphate is heated in a boiling tube. (3mks)

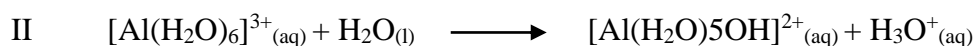
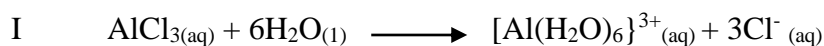
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19. Study the equations below:



Name the processes in equations I and II.

I

II

20. When a solid mixture of substances Q and R is heated, a colourless gas which turns moist red litmus paper blue is produced. Q is soluble in water producing a solution which forms a white precipitate solution of R forms a white solid when carbon (IV) oxide is bubbled through it.

- a) Identify (2mks)

Q

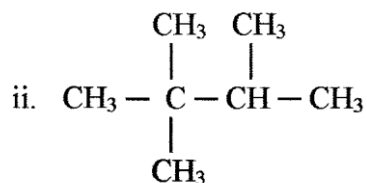
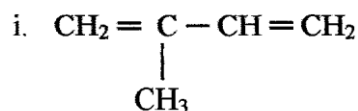
R

- b) Write ionic equation for the reaction between Q and barium chloride. (1mk)

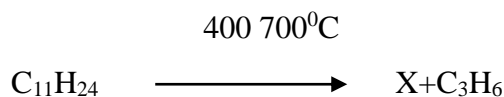
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21. a) Give the systematic names of the following organic compounds. (2mks)



b) The molecular formulae of a certain hydrocarbon is $\text{C}_{11}\text{H}_{24}$. The hydrocarbon can be converted to two other hydrocarbons as shown below.



Draw and name the structural formulae of X. (1mk)

22. During extraction of iron in the blast furnace state the uses of the following in the furnace:

a) Molten slag (1mk)

.....

b) Waste gases leaving the furnace. (1mk)

.....

c) Limestone (1mk)

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23. Describe how solid samples of salts can be obtained from a mixture of Lead (II) chloride, Sodium chloride and Ammonium chloride. (3mks)

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24. a) What is the difference between hygroscopic and deliquescent salts? (1mk)

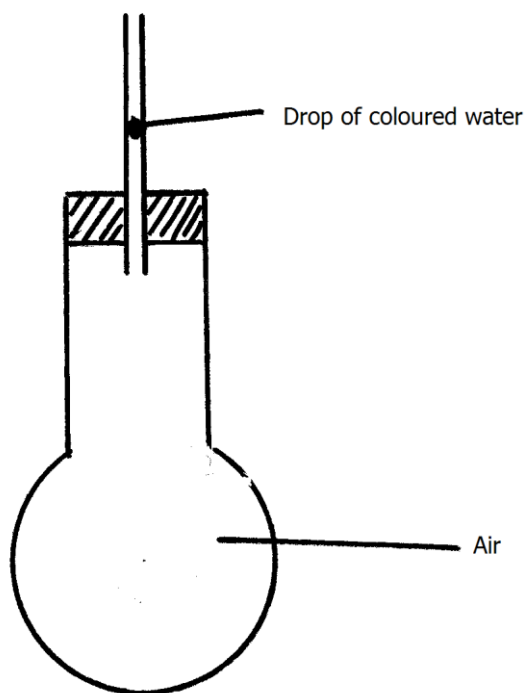
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b) State any two important uses of salts. (2mks)

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25. a) The incomplete set-up below can be used to verify Charles's law for gases. Complete it to show how the two measurements of temperature and volume can be taken. (2mks)



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- b) A drop of concentrated sulphuric acid would be more appropriate than water for the seal. Explain. (1mk)

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26. Define the following terms and in each case give an example.

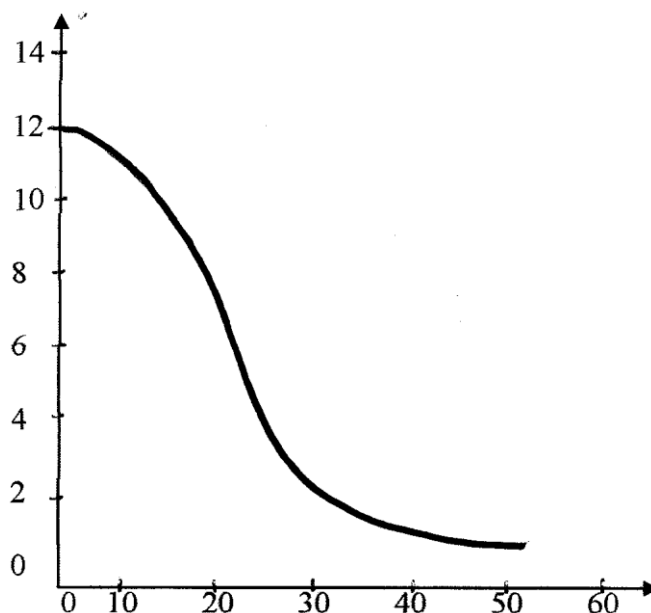
- a) A primary cell. (1 ½ mk)

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- b) A secondary cell. (1 ½ mk)

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27. An unknown liquid was added dropwise to 20cm³ of calcium hydroxide solution. The PH value was recorded after the addition of every 10 drops and a graph PH against the number of drops added plotted as shown below.



- a) From the graph, what can you conclude about the nature of the unknown liquid. (1mk)

- b) From the equation below state the species that reacts as the acid and the base for the formed reaction.

