
**KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS**

**FRIENDS SCHOOL KAMUSINGA HIGH SCHOOL
CHEMISTRY
PAPER 1
TIME: 2 HOURS**

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233/1
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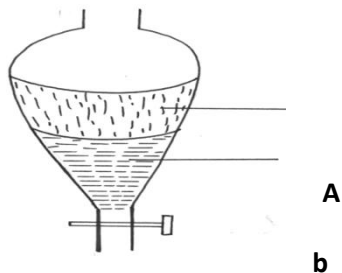
FRIENDS SCHOOL KAMUSINGA KCSE TRIAL AND
AND PRACTICE EXAM 2016

INSTRUCTIONS TO CANDIDATES:

- Write your name and Index number in the space provided above.
- Answer *all* the questions in the spaces provided.
- All working **must** be clearly shown where necessary.
- Mathematical tables and electronic calculators can be used.

Question	Maximum score	Candidate's score
Score 1 - 29	80	

1. A mixture of hexane and water was shaken and left to separate out as shown in the diagram below:-



- (i) Identify liquids A and B (2mks)
 (ii) Apart from density, state **one** other property that makes it possible to separate them using the set-up above? (1mk)

2. Concentrated sulphuric (vi) acid is a common drying agent.

(i) Use an equation to explain why it cannot be used to dry ammonia gas. (1mk)

(ii) Name a suitable drying agent for ammonia. (1mk)

3. Determine the oxidation number of;

(i) Manganese in KMnO_4 . (1mk)

(ii) Chromium in $\text{Cr}_2\text{O}_7^{2-}$. (1mk)

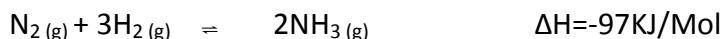
4. Starting with Lead (ii) oxide, describe how lead (ii) sulphate can be prepared in the laboratory. (3mks)

5. A mass of 3.2g of XOH reacts completely with 20cm^3 of 2M sulphuric (vi) acid. (O=16, H=1)

(i) Write the equation for the reaction. (1mk)

(ii) Calculate the relative atomic mass of X in the formula XOH . (2mks)

6. In the Haber process, the industrial manufacture of ammonia is given by the following equation:-



(i) Name **one** source of hydrogen used in this process. (1mk)

(ii) Name the catalyst used in the above reaction. (1mk)

(iii) What is the effect of increasing temperature on the yield of ammonia? Explain. (1mk)

7. Explain the following concepts in respect to aluminium extraction:-

(a) Why cryolite is added to Aluminium Oxide. (1 ½mks)

(b) Why graphite anode is replaced from time to time. (1½mks)

8. When concentrated hydrochloric acid was electrolysed for a long time, two gases were obtained at the anode.

(i) Name the **two** gases. (1mk)

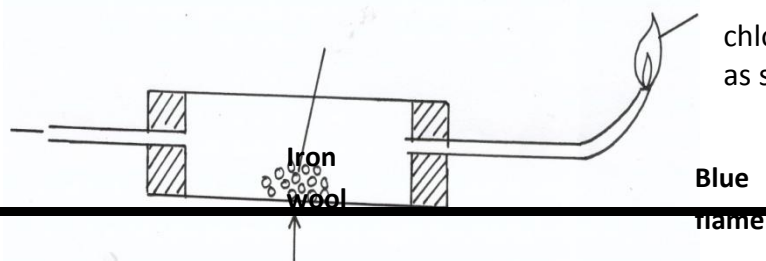
(ii) Explain why the gases were obtained. (2mks)

9. Given the following bond energies:-

C- H	414 KJ/Mol
CL-Cl	244KJ/Mol
C- Cl	326KJ/Mol
H- Cl	431KJ/Mol

Calculate the enthalpy change when methane reacts with excess chlorine. (3mks)

10. Dry hydrogen over heated iron wool

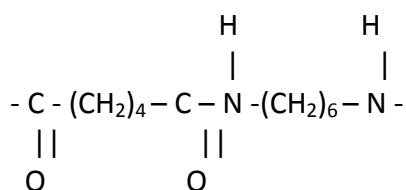


**Dry hydrogen
chloride gas**

heat

- (a) State the observation made in the combustion tube at the end of the experiment. (1mk)
- (b) Write the equation for the reaction taking place:-
 (i) in the combustion tube (1mk)
 (ii) Leading to a production of a blue flame. (1mk)

11. The structure below shows the repeat unit showed in a polymer.



- (i) Name the polymer (1mk)
- (ii) Draw the structures of the two monomers forming the polymer (1mk)
12. The table below shows the number of valence electrons in elements D, E and F.

Element	D	E	F
No. of valence electrons	1	2	7

- (i) Explain why D and E would not be expected to react together to form a compound. (1mk)
- (ii) Write a chemical equation to show the effect of heat on a carbonate of E. (1mk)
13. The following pairs of compounds were reacted together and the maximum temperature rise recorded for each reaction.
- A- 50cm³ of 2M ammonia solution and 50 cm³ of 2M ethanoic acid.
 B- 50 cm³ of 2M sodium hydroxide and 50 cm³ of 2M hydrochloric acid.
 C- 50 cm³ of 2M sodium hydroxide and 50 cm³ of 2M ethanoic acid.
- (a) State the pair which showed:-
 (i) the highest temperature rise. (1mk)
 (ii) the lowest temperature rise. (1mk)
- (b) Explain your answers above. (1mk)
14. (a) Radium 226, whose atomic number is 88, undergoes beta decay to form a new element X. Write an equation for this change. (1mk)
- (b) State **two** differences between nuclear and chemical reactions. (2mks)

Nuclear	Chemical
(i)	
(ii)	

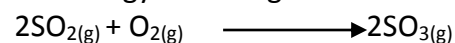
15. The reaction below had attained a state of equilibrium between chromate and dichromate ions.



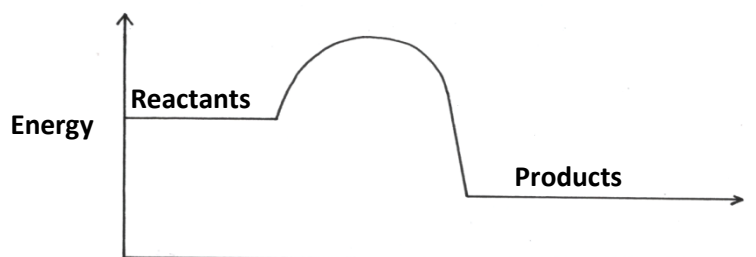
State and explain the effect of adding a few drops of sodium hydroxide to the equilibrium mixture. (2mks)

16. Diamond and graphite are allotropes of carbon.
 (i) What are allotropes? (1mk)
 (ii) Explain why graphite conducts electricity while diamond does not. (2mks)
17. During electrolysis of copper (ii) sulphate solution using graphite electrodes, a current of 2 amperes was passed for 15 minutes. Determine the mass of the products at the cathode. ($1F=96,500C$ $Cu=63.5$) (3mks)
18. Pieces of blue and red litmus papers were placed into a beaker containing water into which Aluminium Chloride had been dissolved.
 (i) Is dissolving of aluminium chloride in water a physical or chemical process? Explain (1mk)
 (ii) State the observations made on the papers. Explain your answer. (2mks)
19. Two cleansing agents are $X=R-COO^-Na^+$ and $Y=R-C_6H_5-SO_3^-Na^+$ where R is a long hydrocarbon chain.
 (i) Identify the two cleaning agents. (1mk)
 (ii) Write the formula of the salt that would be formed when cleaning agent X is added to water containing calcium ions. (1mk)
 (iii) State **one** disadvantage of cleaning agent Y. (1mk)

20. The energy level diagram for the reaction:-



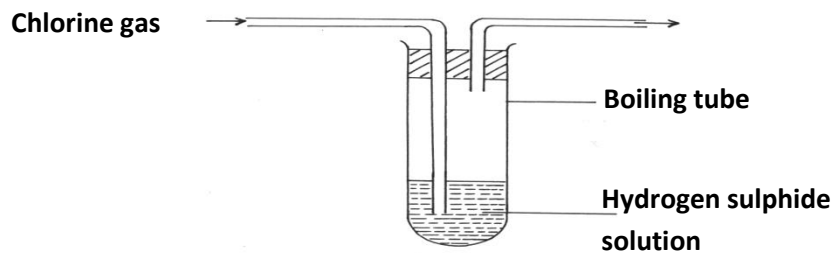
Given below:-



- (i) State **two** ways of increasing the yield of $SO_{3(g)}$ (2mks)
 (ii) On the same axis, draw the curve that would be obtained if a catalyst is used. (1mk)
21. Carbon (II) oxide and nitrogen (iv) oxide are some of the gases released from car exhaust pipes. State how these gases affect the environment. (3mks)
22. When a few drops of aqueous ammonia were added to copper (ii) chloride solution, a light blue precipitate was formed. On addition of excess ammonia solution, a deep blue solution was formed.
 (a) Identify the substance responsible for the:-
 (i) light blue precipitate. (1mk)
 (ii) deep blue solution. (1mk)
 (b) Write an equation for the reaction leading to observation in (a) (ii) above. (1mk)
23. A volume of nitrogen gas diffuses through a porous pot in 70 seconds. How long would it take $400cm^3$ of carbon (iv) oxide to diffuse through the same porous pot? ($C=12$ $O=16$ $N=14$) (3mks)
24. Consider the following electrochemical cell.
 $Zn_{(s)}/Zn^{2+}_{(aq)} // Pb_{(aq)}/Pb_{(s)}$
 (i) Name the electrodes for the above cell. (1mk)
 (ii) Write the electrodes for the above cell (1mk)
 (iii) Name a possible salt bridge. (1mk)
25. Lead (ii)nitrate was heated strongly for some time.
 (i) State **two** observations made during heating. (2mks)
 (ii) Write an equation for the reaction. (1mk)
26. Draw a dot (.) and cross (x) diagram to show bonding in:-

- (i) Ammonium ion (NH_4) (1 ½mks)
(ii) Silane (SiH_4) (1 ½mks)
(N=14 H=1 Si=14)

27. Chlorine gas was bubbled into a solution of hydrogen sulphide as shown below:-



- (i) Explain the observations made in the boiling tube. (2mks)
(ii) What precautions should be taken in this experiment? (1mk)
28. What is the difference between thermosoftening and thermosetting plastics? (2mks)

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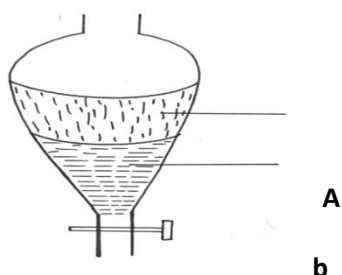
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- (i) Write the equation for the reaction. (1mk)
- (ii) Calculate the relative atomic mass of X in the formula XOH . (2mks)
6. In the Haber process, the industrial manufacture of ammonia is given by the following equation:-
- $$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) = 2\text{NH}_3(\text{g}) \quad \Delta H = -97\text{KJ/Mol}$$
- (i) Name **one** source of hydrogen used in this process. (1mk)
- (ii) Name the catalyst used in the above reaction. (1mk)
- (iii) What is the effect of increasing temperature on the yield of ammonia? Explain. (1mk)
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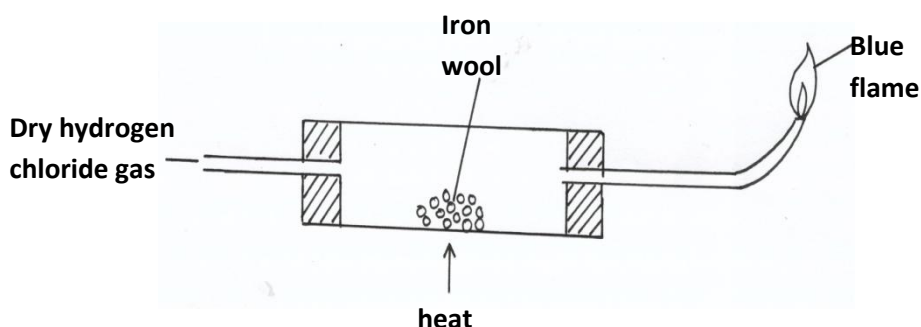
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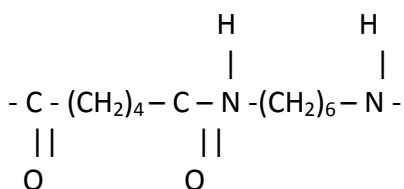
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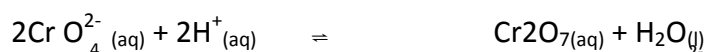
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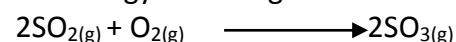
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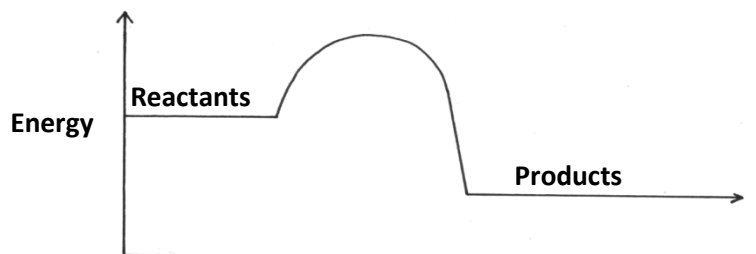
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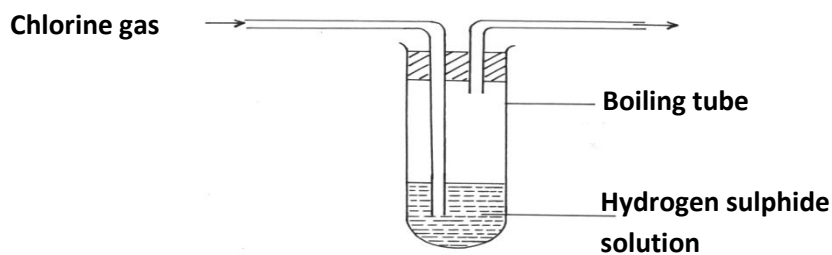
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