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CHEMISTRY

Paper 1

(THEORY)

March.2017

2hours

THE ALLIANCE GIRL'S HIGH SCHOOL

PRE-MOCK EXAMINATIONS

233/1 Paper 1

Adm. No. -----

Rollcall No. -----

Class -----

Date-----

Instructions to candidates

Write your details in the spaces provided above

*Answer **All** the questions in the spaces provided in the question paper.*

Knec mathematical tables and silent non-programmable electronic calculators may be used.

*All working **MUST** be shown clearly where necessary.*

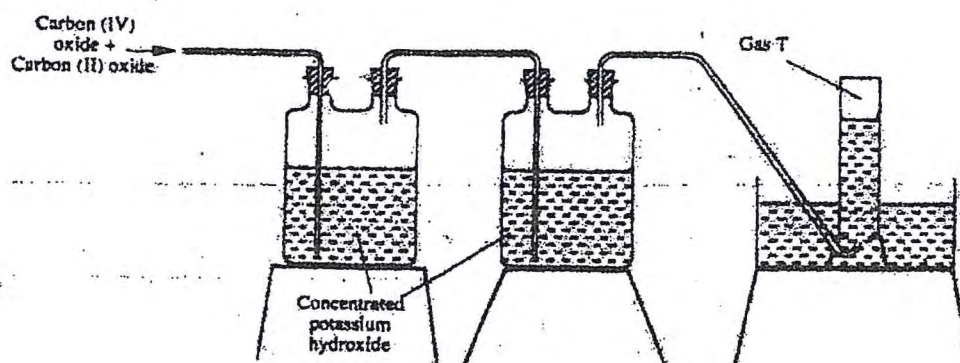
*This paper consists of **11** printed pages.*

Candidate should check the question paper to ascertain that all the pages are printed as indicated and that no question is missing.

For examiner's use only

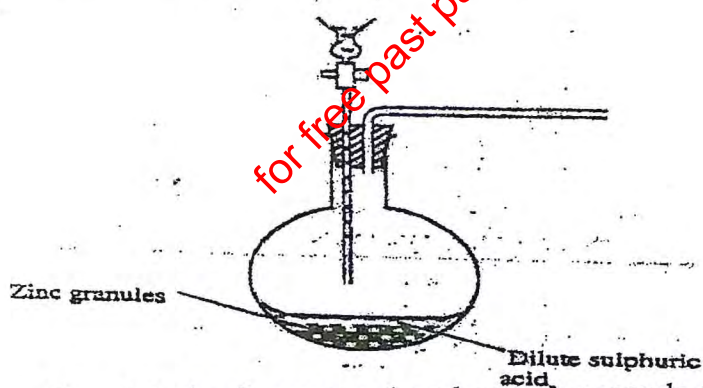
Questions	Maximum score	Candidate's score
1-28	80	

1. The diagram below represent part of the set up used to prepare and collect gas T.



- (a) Name two reagents that reacted to produce both carbon (IV) oxide and carbon (II) oxide. (1mk)
- (b) Write an equation for the reaction which takes place in the bottles. (1mk)
- (c) Give a reason why carbon (II) oxide is not easily detected. (1mk)

2. The set up below was used to prepare hydrogen gas.

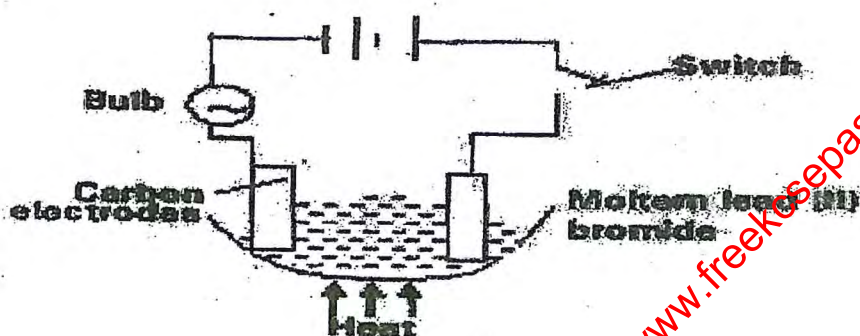


Complete the diagram to show how a dry sample of hydrogen gas can be collected. (3mk)

3. When 31.2g of hydrated Aluminium oxide ($\text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O}$) was heated to a constant mass of 20.6g of Aluminium oxide (Al_2O_3) was obtained. Determine the value of x in hydrated oxide. (Al= 27.0, O=16.0, H=1.0)

(3 mks)

4. Study the set up below and answer the questions that flows



(a) Label the cathode and anode on the diagram

(2mks)

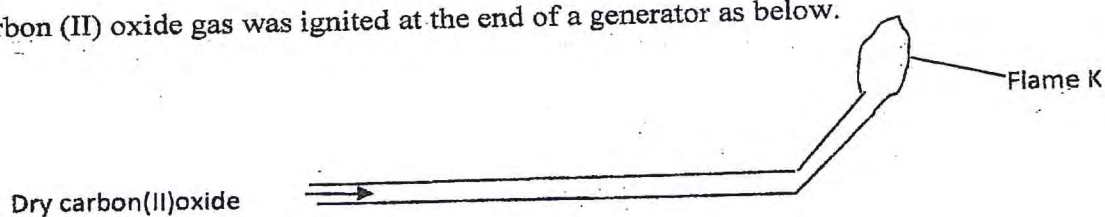
(b) State and explain the observations that would be made at the electrodes when the circuit is completed

Statement

(3 mks)

Explanation

5. Carbon (II) oxide gas was ignited at the end of a generator as below.



(a) Write chemical equation for the reaction taking place at flame K. (1mk)

(b) When trying to put off an oil fire, water is not used; however carbon (iv) oxide is used. Explain. (2mks)

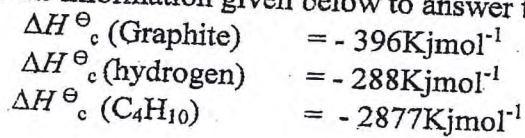
6. 200 cm^3 of CO and 200 cm^3 of O_2 are mixed and exploded in a steel tank. The gases were cooled to the original temperature and pressure. Calculate the composition of the residual gases. (3 mks)

7 (a) Define the term molar heat of formation? (1)

(b) State the Hess's law (1)

(c) Write the equation for the formation of $(\text{C}_4\text{H}_{10})$ from its elements. (1)

8. Use the information given below to answer the questions that follow:-



Using an energy level diagram, determine the heat of formation of butane (C_4H_{10}).

(2 mks)

9. The table below shows the tests carried out on a sample of water and the results obtained.

	Tests	Results
I	Addition of sodium hydroxide solution	White precipitate which dissolves in excess
II	Addition of excess aqueous ammonia	Colourless solution obtained
III	Addition of dilute hydrochloric acid and barium chloride	White precipitate

- Identify the anion present in the water (1 mk)
- Write an ionic equation for the reaction in III (1 mk)
- Write the formula of the complex ion formed in II (1 mk)

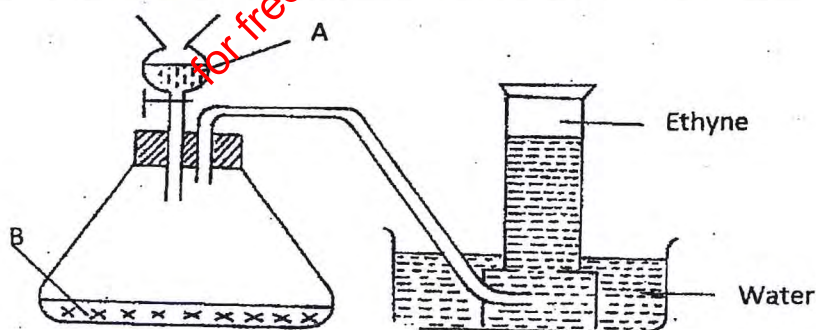
10. Describe how a solid sample of the double salt, ammonium iron(II) sulphate, can be prepared using the following reagents; Aqueous ammonia, sulphuric(VI) acid and iron metal. (3 marks)

11. A solution of chlorine in Tetrachloromethane turns colourless when propene gas is bubbled through it
(a) Name the type of reaction that takes place (1 mk)

(b) Write an equation for the above reaction (1 mk)

12. When excess dilute hydrochloric acid was added to sodium sulphite, 960cm^3 of sulphur (IV) Oxide gas was produced. Calculate the mass of sodium sulphite that was used.
(Molar mass of sodium sulphite = 126g and molar gas volume = $24,000\text{cm}^3$) (3 marks)

13. Study the diagram below and use it to answer the questions that follow.



(a) Name the substances

A

(2mks)

B

(b) Write an equation for the reaction between A and B.

(1mk)

14. (a) An organic compound P contains 64.9% carbon, 13.5% hydrogen and 21.6% oxygen. The relative formula mass of P is 74. Given that C=12.0, H=1.0, O=16.0

(i) Determine the empirical formula of P.

(3 marks)

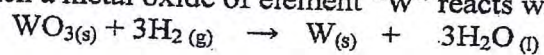
(ii) Determine the molecular formula of P.

(1 mk)

15. Distinguish between a strong and weak acid. Give an example of each

(3 Marks)

16. When a metal oxide of element "W" reacts with hydrogen, the equation for the reaction is:



(a) Compare the reactivity of element "W" with hydrogen gas.

(1mk)

(b) Give one commercial use of Hydrogen gas.

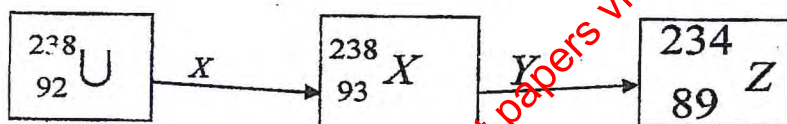
(1mk)

17. In the equation below, identify the reagent that acts as a base for forward reaction. Give a reason (2 marks)



18. Calculate the relative formula mass of gas A given that the time taken for equal volumes of oxygen to diffuse through the same hole is 20 seconds and 24 seconds respectively (O=16.0) (2 marks)

19. Below is a part of radioactive decay series which start with uranium 238. Study it and answer the following questions.



(a) Identify radiations X and Y

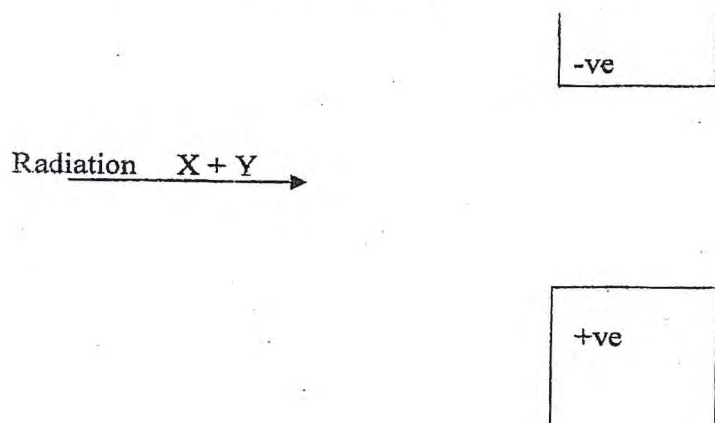
X

(1mk)

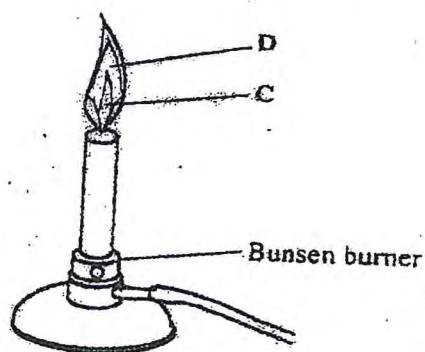
Y

(1mk)

- (b) The above identified radiations are passed through an electric field. Complete the diagram to clearly show how they are affected by electric field. (2mks)



20. The diagram below shows a Bunsen burner when in use.



Name the regions labelled C and D.

(2marks) →

- 21(a). The following two tests were carried out on chlorine which was bubbled in water contained in two test tubes. A piece of blue flower was dropped into the first test tube. Using equations explain how chlorine bleached the flower. (2 mks)

- (b) The second test tube was corked and exposed to sunlight. After a few days it was found to contain a gas that rekindled a glowing splint. Write an equation for the reaction which produced the gas. (1 mk) →

© What is the physical identification test for chlorine gas?.

(1mk)

22. A sealed glass tube containing air at s.t.p was immersed in water at 100°C . Assuming that there was no increase in the volume of the glass tube due to the expansion of the glass, calculate the pressure of the inside tube. (standard pressure = 760mmHg.) (3 mks)

23. The reaction of propane with chlorine gas gave a compound with formula $\text{C}_3\text{H}_7\text{Cl}$
(a) What condition is necessary for the above reaction to take place (1 mk)

- (b) Draw a structured formula of compound $\text{C}_3\text{H}_7\text{Cl}$ (1mk)

24. Classify the following processes as either chemical or physical.

(3 marks)

Process	Type of change
(a) Heating copper(II) sulphate crystals	
(b) Obtaining kerosene crude oil	
(c) souring of milk	

25. Calculate the concentration of Sulphuric acid in moles per litre if 15cm^3 of the acid is completely neutralized by 20cm^3 of one molar potassium hydroxide. (3 marks)

26. 100g of radioactive substance was reduced to 12.5 g within 15.6 years. Calculate the half life of the substance (2mks)

27. Calculate the mass of nitrogen (IV) oxide gas that would occupy the same volume as 10g of hydrogen gas at same temperature and pressure. (H=1.0, N=14.0, O=16.0) (2 marks)

28.(a) Give the formula of two cations whose salts are all soluble. (2mk)

(b) Give one anion whose salts are all soluble. (1mk)

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