

Name.....

Index No...../.....

School.....

Date

Candidate's Signature.....

233/1

CHEMISTRY

PAPER 1

THEORY

JULY / AUGUST 2020

Time: 2 Hours

NANDI CENTRAL DISTRICT JOINT EVALUATION TEST - 2020
Kenya Certificate of Secondary Education (K.C.S.E)

CHEMISTRY

PAPER 1

(THEORY)

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Answer all the questions in the spaces provided
- Mathematical tables and silent electronic calculators may be used
- All workings must be clearly shown where necessary

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1 – 30	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

SECTION A

Answer ALL the questions in this section.

1. The pH values of some solutions are given below. (2marks)

Substance	pH
P	9.0
Q	2.2
R	13.5
S	4.8

- a) Which substance is likely to be?

i) Nitric (v)acid (½ mk)

ii) Toothpaste (½ mk)

- b) Solution R is put in a beaker. Litmus solution is added, and then substance Q is added a little at a time until no further change is noted. Outline the observations made (2mks)

2. Three nitrates Q, R and S were each heated and the products formed were tabulated as shown below:-

NITRATE	PRODUCTS
Q	Metal nitrate + oxygen
R	Metal + nitrogen (IV) oxide to oxygen
S	Nitrogen (I) oxide + water

- a) Identify nitrates

S (1mk)

R (1mk)

- b) What is the general name of the metal in the same group as Q.? (1mk)

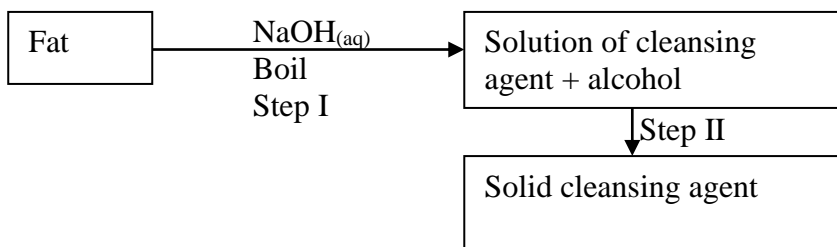
3. When excess chlorine is bubbled through cold dilute sodium hydroxide solution, the resulting solution act as a bleaching agent.

- a) Write a chemical equation for the reaction that produces the bleaching agent. (1mk)

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.....
b) Name the bleaching compound and show how it bleaches using an equation. (2mks)

.....
.....
4. 20.0cm^3 of a solution containing 4g per litre of sodium hydroxide was neutralized by 8.0cm^3 of dilute sulphuric (VI) acid. Calculate the concentration of sulphuric (vi)acid in moles per liter (Na=23.0, O=16.0, H=1.0) (3mks)

5. The scheme below was used to prepare a cleansing agent. Study it and answer the questions that follow.

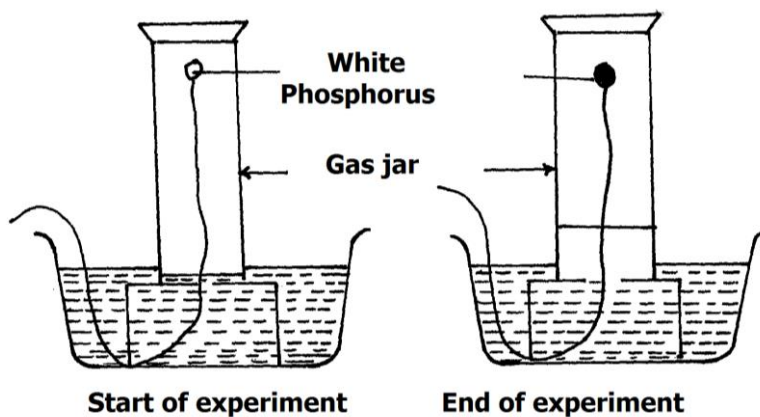


i) What name is given to the type of cleansing agent prepared by the method shown in the scheme? (1mk)

.....
.....
ii) Name one chemical substance added in step II (1mk)

.....
.....
iii) What is the purpose of adding the chemical substance named in (ii) above. (1mk)

6. A student set up the experiment below



a) What was the aim of the experiment? (1mk)

.....
.....

b) Give the observations made. (1mk)

.....
.....

c) Write an equation for the reaction that takes place in the gas jar (1mk)

.....
.....

7. In an experiment, ammonium chloride was heated in a test-tube. A moist red litmus paper placed at the mouth of the test-tube first changed blue then red.

a) State the observation made. (1mk)

.....
.....

b) Explain the observation stated in (a) above. (2mks)

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.....
.....

8. Explain what is observed when carbon (iv) oxide is bubbled through calcium hydroxide solution until excess. (3mks)

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.....
.....

9. a) State Charles Law (1mk)

b) A gas occupies a volume of 40 litres at s.t.p. At what pressure will its volume be doubled if the temperature rises to 105°C? (2mks)

10. The table below gives the atomic numbers of 3 elements U, V, W

Element	U	V	W
Atomic Number	9	17	35

The letters are not the actual symbols of the elements

a) To which group of the periodic table do the elements, belong? (1mk)

b) Which element is the most reactive? Give a reason. (1mk)

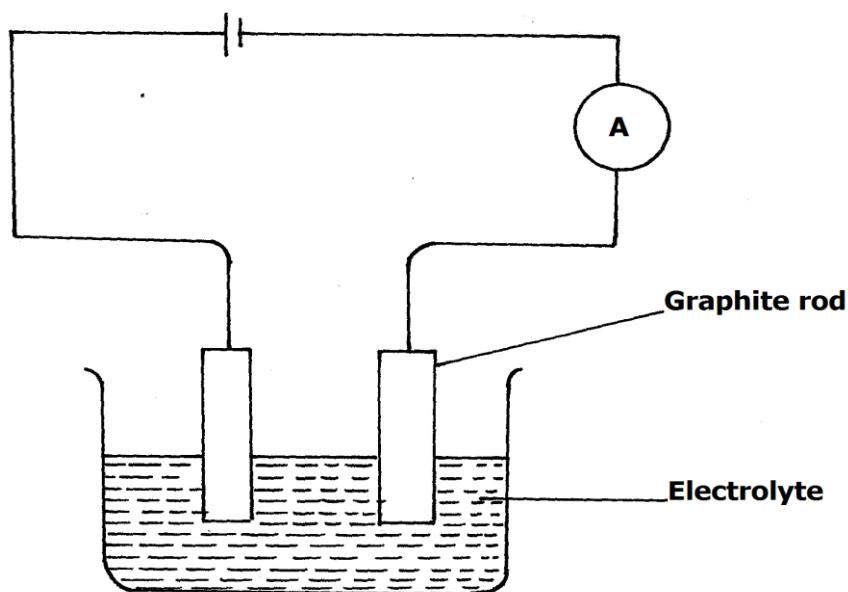
c) Why do their boiling points increase down the group? (1mk)

11. A stream of hydrogen is passed over 1.8g of heated copper oxide. At the end 1.6g of solid is left. Determine the empirical formula of the oxide. (Cu=64, O=16) (3mks)

12. Describe how a dry sample of copper (ii) chloride may be prepared in the laboratory starting with solid copper (ii) carbonate. (3mks)

.....

13. The set up below was used to electrolyze aqueous magnesium sulphate. The initial reading on the ammeter can be increased by moving the electrodes closer.



- a) State one other ways in which the ammeter reading may be increased (1mk)

.....

- b) Name the products at the cathode and anode

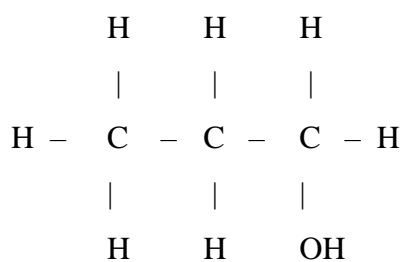
- i) Cathode (1mk)

.....

ii) Anode (1mk)

.....

14. A compound X reacts with concentrated sulphuric (vi) acid and water to produce another compound whose structural formula is given as



Give the name and structural formula of X

a) Name (1mk)

.....

b) Structure (1mk)

.....

.....

15. In an experiment, the quantity of electricity passed to deposit 3.57g of metal Q from its salt was 11580 coulombs. Calculate the number of Faradays required to deposit 1 mole of Q. (2mks)
(R.A.M of Q is 119)

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.....

.....

16. a) Distinguish between exothermic and endothermic reaction (2mks)

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- b) Changes of state are either exothermic or endothermic. Name a change of state that is:

i) Endothermic (½ mk)

.....

ii) Exothermic (½ mk)

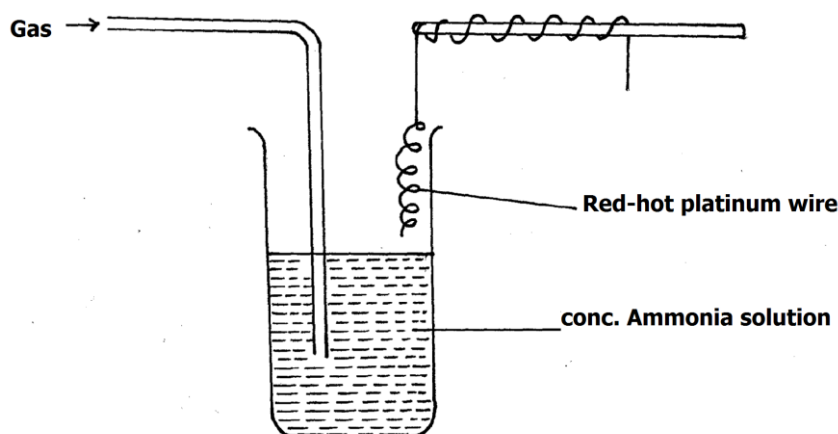
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17. Explain why cooking pots made of aluminum do not corrode easily when exposed to air (2mks)

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18. Oxygen was bubbled into concentrated ammonia solution as shown below.



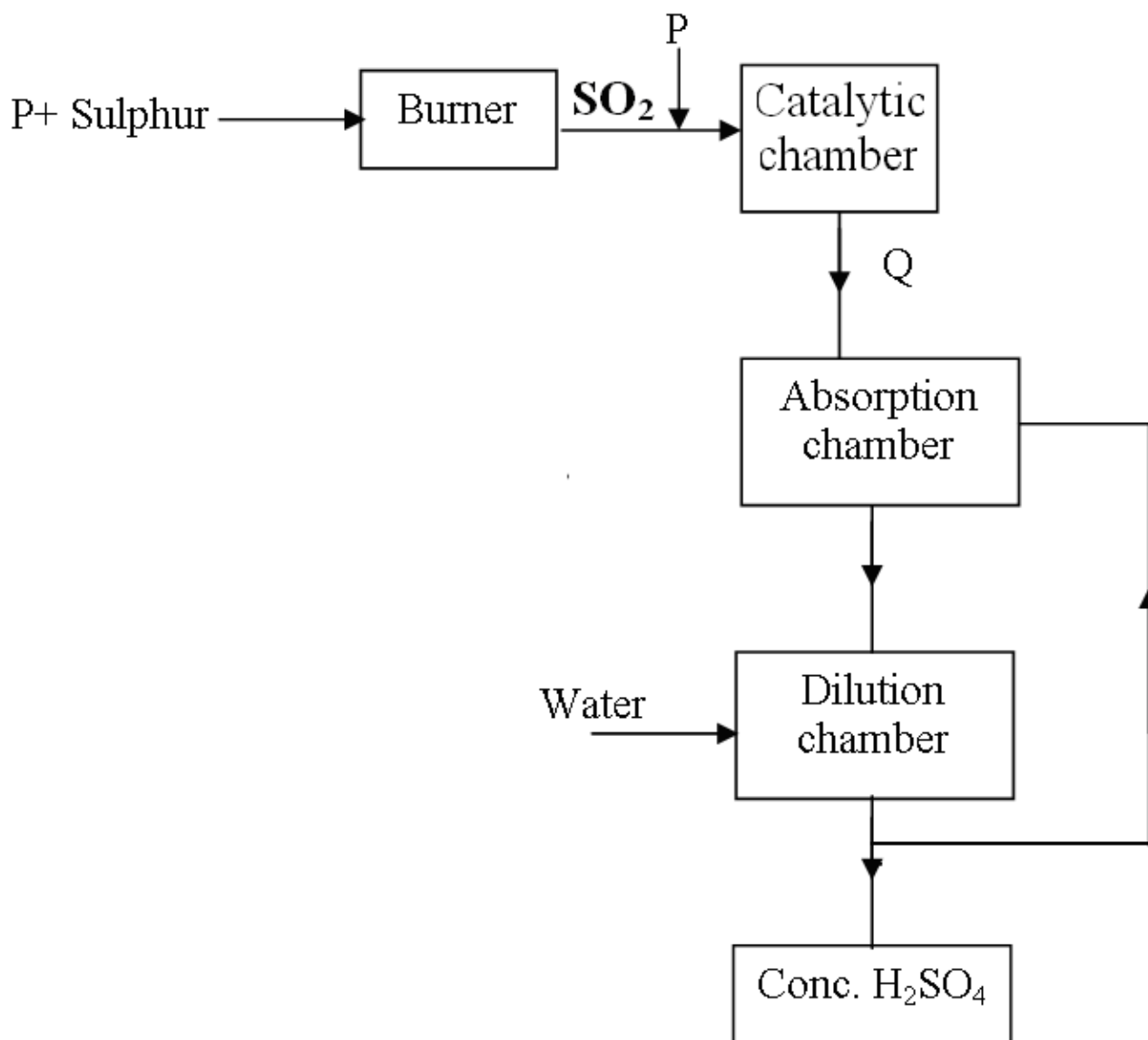
a) The platinum wire remained red-hot even though it was no longer being heated. Explain (1mk)

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b) Brown fumes were observed in the boiling tube. Using chemical equations. Explain this observation. (2mks)

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19. Below is a chart for contact process for manufacture of sulphuric (iv) acid



a) Name P and Q

P

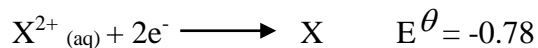
(½ mk)

Q (½ mk)

b) Write an equation of reaction that leads to formation of S

.....
.....

20. You are given the following half-cell reactions



a) Obtain the equation for the overall cell reaction (1mk)

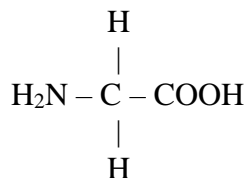
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b) Determine the E.M.F of the cell (1mk)

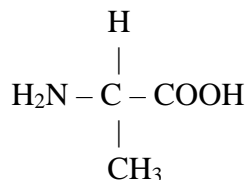
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21. A piece of cheese contains a protein. Proteins are naturally occurring polymers made up of amino acids. The structures of the two amino acids are shown below

Glycine



Alanine

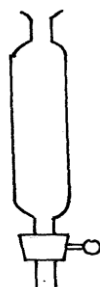


a) Name the type of polymerization involved in protein formation. (1mk)

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.....

b) Write an equation showing how a protein polymer can be formed from the reaction between the amino acids shown above. (1mk)

22. i) Name the piece of apparatus shown below (1mk)



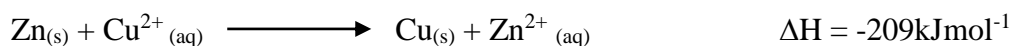
ii) What is the use of the apparatus (1mk)

.....

iii) Name the physical property on which the use depends (1mk)

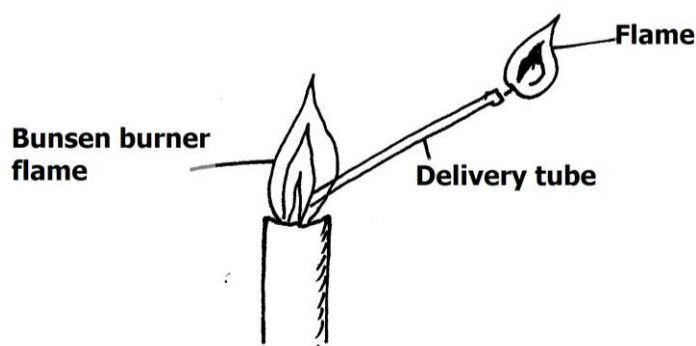
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23. Zinc metal displaces copper according to the thermochemical ionic equation below



Copper that was in 25cm³ of 0.2m copper (ii) sulphate solution was completely displaced by 5g of zinc metal. Determine the rise in temperature due to the reaction (specific heat capacity of water = 4.2kJ kg⁻¹k⁻¹, density of water = 1g/cm³) (3mks)

24.



Study the set up above and answer the questions that follow.

a) What does the experiment demonstrate? (½ mk)

.....

b) When is this type of Busen burner flame produced? (½ mk)

.....

c) Give two characteristics of the type of flame used in the set up (1mk)

.....
.....
25. State two differences between nuclear and chemical reactions. (2mks)

.....
.....
26. The table gives some properties of four substances. Use it to answer the questions that follow

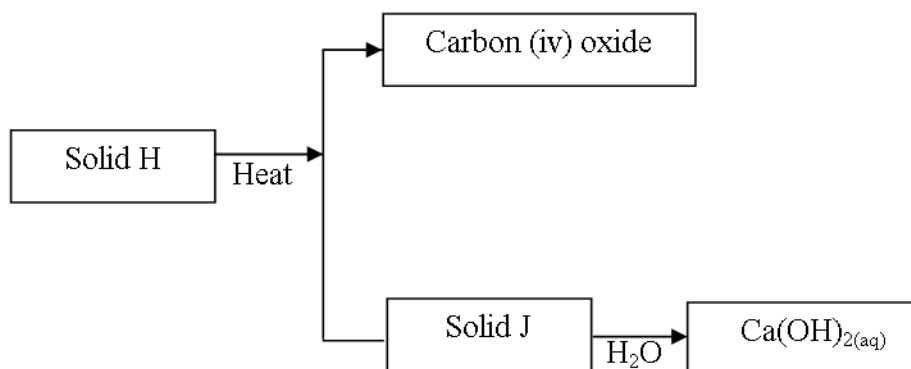
Substance	M.P ($^{\circ}\text{C}$)	B.P ($^{\circ}\text{C}$)	Electrical conductivity	
			Solid	Liquid
A	1128	2657	Good	Good
B	-166	-95	Poor	Poor
C	854	1790	Poor	Poor
D	2230	3714	Poor	Poor

a) Which substance has giant atomic structure? (1mk)

.....
b) What is the bonding in C? (1mk)

.....
c) Which substances have giant metallic structure? (1mk)

.....
27. Give the scheme below to answer the questions that follow



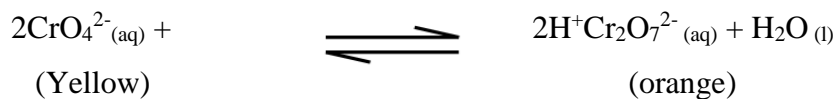
Use the scheme below to answer the questions that follow

a) Identify the solids
H (1mk)

I (1mk)

b) State one commercial use of solid J (1mk)

28. The solution of dichromate ions attains equilibrium as shown below.



Explain what will happen if a solution of sodium hydroxide is added to the solution at equilibrium (2mks)

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.....

.....

29. When water reacts with potassium, the hydrogen produced ignites explosively on the surface of water.

i) What causes this ignition? (1mk)

.....

ii) Write an equation to show how this ignition occurs (1mk)

.....

30. The table below shows the tests carried out on separate samples of water drawn from a well and the results obtained

Tests	Results
i) Addition of excess aqueous ammonia	White precipitate
ii) Addition of a few drops of dilute sulphuric acid	No white precipitate
iii) Addition of dilute hydrochloric acid followed by a few drops of barium chloride	White precipitate

a) Identify the cation and the anion present in water.

Cation (1mk)

Anion (1mk)

b) Write an equation for the reaction which takes place in test (iii) (1mk)

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