

NAME: INDEX NO:

SIGNATURE: DATE :

233/1
CHEMISTRY
PAPER 1
THEORY
JULY / AUGUST 2013
TIME: 2 HOURS

NANDI NORTH DISTRICT JOINT MOCK EVALUATION TEST 2013

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

CHEMISTRY
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- Write your Name and Index Number in the spaces provided above.
- Answer all the questions in the spaces provided after each question.
- Mathematical tables and non-programmable electronic calculators may be used.
- ALL working must be clearly shown where necessary.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAX SCORE	CANDIDATE'S SCORE
1 – 29	80	

1. State **one** use of each of the following apparatus in the laboratory:

(i) Desicator (1mk)

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(ii) Crucible (1mk)

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(iii) Deflagrating spoon (1mk)

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2. Name the particles responsible for the electrical conductivity of:

(a) Graphite: (1mk)

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(b) Magnesium sulphate (1mk)

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3. Complete the diagram below to show how the particles and rays are deflected and of which material each of item is stopped. (2mks)

4. The diagram below was meant to represent laboratory preparation of dry oxygen.

(a) Name:
(i) Substance X (1mk)

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(ii) Suitable drying agent (1mk)

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

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5. (a) State one cause of temporary hardness in water. (1mk)

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(b) How does distillation remove hardness from water? (2mks)

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6. Describe how you can separate a mixture of sand and common salt. (3mks)

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7. The set up was used to prepare and collect ethene gas. Study it and answer the questions that follow:

(i) Name substance T. (1mk)

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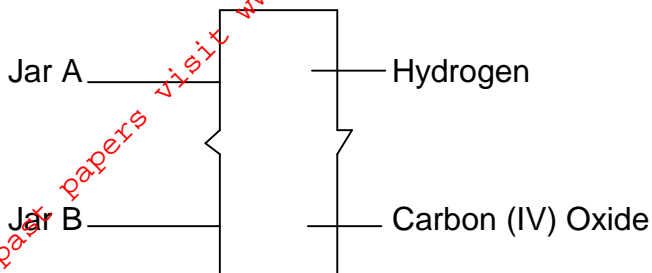
(ii) Give the property of ethene that allows it to be collected as shown in the diagram. (1mk)

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(iii) One of the reactions undergone by ethene is addition polymerization. Give the name of the polymer formed. (1mk)

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8. The gas Jar full of hydrogen gas was placed upside down on top of a gas jar full of air.



After 30 seconds, the gas jars were separated and immediately tested with a burning splint.

Describe what would be observed in:

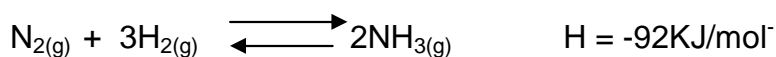
(a) Jar A (1mk)

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.....

(b) Jar B (1mk)

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.....

9. Given the equation:



Explain what happens to the position of equilibrium when:

(i) More hydrogen is introduced into the system. (1mk)

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.....

(ii) The pressure of the system is reduced. (1mk)

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(iii) Temperature is raised. (1mk)

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10. Using dots and crosses to represent electrons, draw diagrams to represent bonding in;

(i) Hydroxonium ion, H_3O^+ (H=1, O=8) (2mks)

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(ii) Sodium fluoride, NaF (Na = 11, F=9) (1mk)

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11. The products formed by action of heat on nitrates of elements A, B and C are shown below.

Nitrates	Products formed
A	Metal oxide + Nitrogen (iv) oxide + Oxygen
B	Metal + Oxygen + Nitrogen (iv) oxide
C	Metal Nitrite + Oxygen

(a) Arrange the metals in order of reactivity. (1mk)

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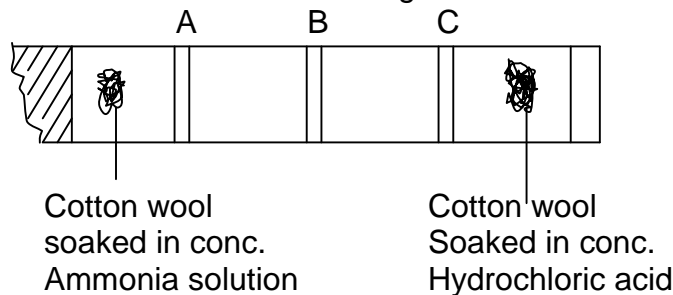
(b) Which element forms a soluble carbonate? (1mk)

.....

(c) Give an example of B. (1mk)

.....

12. The following apparatus was set-up to study the movement of gas molecules. A white disc is formed where the two gases meet and mix.



(a) Where is the white disc most likely to be formed? Explain your answer. (2mks)

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(b) Write the equation of the reaction leading to the formation of the white disc. (1mk)

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13. Iron reacts with steam, write a balanced chemical equation for the reaction. (2mks)

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14. Iron is obtained from its ores by reduction in the blast furnace.

(i) Name **two** impurities likely to be present in pig iron formed in the blast furnace. (1mk)

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(ii) Give **one** effect of these impurities on the physical properties of iron. (1mk)

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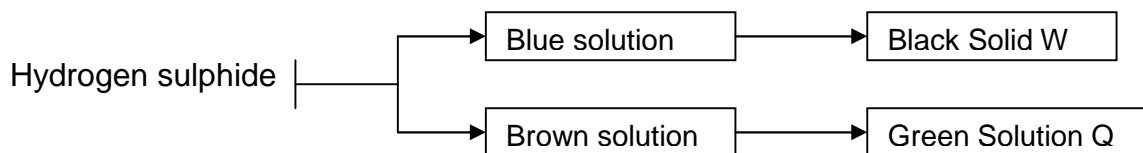
15. A mass of 40g of a saturated solution of potassium chlorate at 25°C yields 14g of potassium chlorate when evaporated to dryness. Calculate the solubility of potassium chlorate at 25°C. (3mks)

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16. Solid J reacts with cold water but solid K do not. L reduce oxide of M but does not reduce the oxide of K. Arrange the elements in order of reactivity starting with the most reactive. (2mks)

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17. Hydrogen sulphide gas was bubbled into two solutions of metallic nitrates or represented in the flow chart below.



(a) Name the ions present in:-

- (i) Blue solution:.....
- (ii) Brown solution:.....

(b) Write an ionic equation for the reaction that leads to the formation of green solution Q.

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18. When 0.288g of an oxide of metal M was reduced using suitable reducing agents, 0.256g of the pure metal was formed. Determine the empirical formula of the oxide (M = 64, O = 16) (3mks)

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19. Study the set up below and answer the questions that follow.

(a) Name the gas that is produced when hydrochloric acid reacts with marble chips. (1mk)

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(b) Suggest **two** ways by which gas in (a) above is prevented from escaping through the funnel. (2mks)

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(c) State the purpose of wood charcoal. (1mk)

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20. The atomic numbers of element B and Z are 11 and 9 respectively. State and explain the electrical conductivity of the compound BZ in:

(a) Solid state (1½mk)

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(b) Aqueous state. (1½mks)

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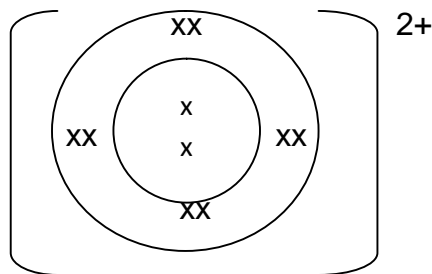
21. (a) Define the molar heat of combustion. (1mk)

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(b) When 8.0g of sulphur is completely burned in oxygen in a calorimeter, the heat evolved raises the temperature of 500cm³ of water by 35⁰C. Calculate the molar heat of combustion of sulphur (The specific heat capacity of water 4.2kJ/Kg/k, r.a.m. of S = 32) (2mks)

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22. Below is an ionic electronic structure of element X



Write down its:

(i) Valency (1mk)

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.....

(ii) Period (1mk)

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.....

(iii) Formula of its chloride (1mk)

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23. A certain volume of gas S takes 180 seconds to diffuse through a porous plug. Molar mass of S is 18g. Equal volume of gas Q takes 240 seconds to diffuse through the same plug. Calculate the molar mass of Q. (2mks)

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24. (a) Write an equation to show how carbon (iv) oxide can be obtained from limestone (CaCO₃) by heating. (1mk)

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(b) Give **two** properties of carbon (iv) oxide that makes it suitable for use in:

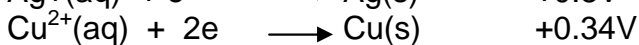
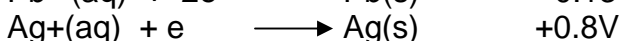
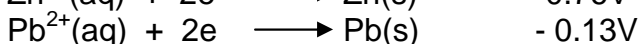
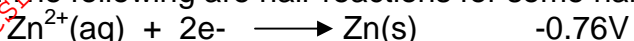
(i) Extinguishing fire. (1mk)

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(ii) Making of fizzy drinks. (1mk)

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25. The following are half-reactions for some half-cells and their respective potentials.



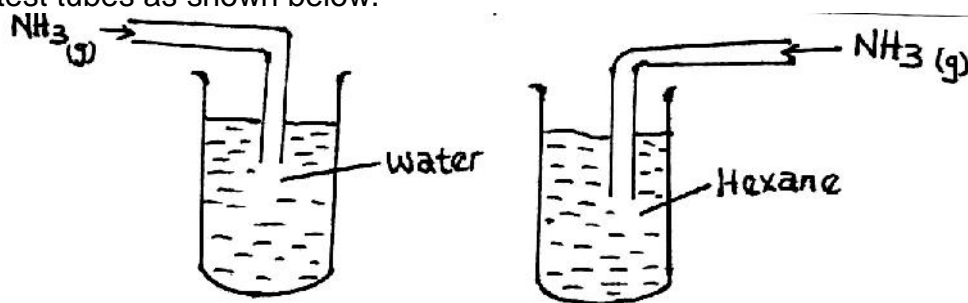
(a) Write the overall cell equation for two half-cells which will give the highest e.m.f. (1mk)

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(b) Calculate the e.m.f. of the cell in (a) above. (1mk)

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26. Ammonia gas was bubbled through equal amount of water and Hexane in separate test tubes as shown below.



(a) Explain the observations made when a wet red litmus paper was dipped into the two test-tubes. (2mks)

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(b) The table below shows the pH values of some solutions.

Solution	A	B	C	D
pH	12.0	7.0	2.0	5.5

(iii) Which solution forms a complex with aluminium oxide. (1mk)

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(iv) Which solution is likely to be a passion juice? (1mk)

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27. Draw all the possible structures of an organic compound with a molecular formula C_5H_{12} . (3mks)

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28. 62g of hydrated sodium carbonate $Na_2CO_3 \cdot nH_2O$ were dissolved in distilled water and made up to one litre of solution. $20cm^3$ of 1.5M hydrochloric acid completely reacted with $30.0cm^3$ sample of the sodium carbonate solution. Determine the value of n (Na = 23.0, C=12.0, O = 16.0, H =1). (2mks)

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29. Describe how a solid sample of Lead (II) Sulphate would be prepared using the following reagents. Dilute sulphuric acid, nitric acid, solid lead (II) carbonate. (2mks)

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