HOLA SECONDARY SCHOOL

CHEMISTRY FORM THREE

PAPER 233/2

NAME CLASS ADM.NO

INSTRUCTIONS

Answer all the questions in this paper

Electronic calculator may be used

Show all your working in the spaces provided.

39K

1.a) An atom of K can be represented as 19 . What does the number 19 represent? (1MK)

b) Study the information in the table below and answer the questions that follow (Letters are not the actual symbols of the elements)

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Element arrangement of stable ion | Atom radius (nm) |  |
| N  P  R  S  T  U | 2.8.8  2.8.8  2.8  2.8  2  2.8 | 0.197  0.099  0.160  0.186  0.152  0.072 | 0.099  0.181  0.065  0.095  0.068  0.136 |

i)Write the formula of the compound formed when N reacts with P.

(Atomic numbers are N =20 P =17) (1MK)

ii) Identify the elements which belong to the third period of the periodic table. Explain (2mks)

iii) Which of the elements identified in b (ii) above comes first in the third period ? Explain (2mks)

iv) Select two elements which are non-metals. (1mk)

c. The table below gives some properties of substances 1, 11, 111, and 1v .Study it and answer the questions that follow.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Substance | Electrical conductivity | | | M.PoC | B.PoC |
| Solid | Liquid | |
| I  II  III  IV | Does not conduct  Conduct  Does not conduct  Does not conduct | | Conduct  Conduct  Does not conduct  Does not conduct | 801  650  1700  113 | 1420  1107  2200  440 |

i)What type of bonding exists in substance I and II (2mks)

ii)Which substance is likely to be sulphur? Explain (2mks)

3. In an experiment carbon (iv) oxide was passed over heated charcoal and the gas produced collected as shown in the diagram below.

a.(i) Write an equation for the reaction that took place in the combustion tube. (1mk)

(ii) Name another chemical substance that can be used instead of sodium hydroxide. (1mk)

(iii) Describe a simple chemical test that can be used to distinguish between carbon (II) oxide and carbon (Iv) oxide. (2mk)

(iv) State one use of carbon (II) oxide. (1mk)

b) In another experiment to synthesize sodium carbonate in the lab student passed carbon (IV) oxide and ammonia gas into brine as shown in the flow diagram below . Use it to answer the questions that follow.

Heating Unit D

Filtration Unit C

Cooling flask B

Brine chamber

Carbon (IV) Oxide

From a fire

extinguisher

Anhydrous sodium carbonate

(i)Why is the mixture is obtained in chamber A cooled in chamber B. (2MKS)

(ii) Give a reason why it is difficult to synthesize potassium carbonate by the same method. (1mk)

(iv) State two properties of carbon (IV) Oxide that enables it to be used in the fire extinguishers. (1mk)

4. a)What is a saturated solution? (1mk)

(b) The diagram below represents an arrangement for a large scale manufacture of ethanol for domestic consumption.

(i)Name the process by which ethanol is obtained from crude oil. (1mk)

(ii) Suggest TWO reasons why water is a coolant in this process. (2MKs)

(ii) Why is it possible to separate ethanol from that mixture by this process. (2mks)

C (i) Describe how the mixture of ammonium chloride, sodium chloride and lead II chloride can be separated if all the components of the mixture are to be recovered (3mks)

(ii) The following process shows how Nitrogen and Oxygen can be obtained from air.

Filter Air KOH(aq) and Nitrogen and Oxygen mixture

Anhydrous

Calcium chloride

A

Liquid Air

B

Nitrogen Oxygen

I. Name the processes A (1MK)

B (1MK)

II.What is the purpose of

Potassium hydroxide solution KOH (aq) in the process. (1mk)

Anhydrous Calcium Chloride solid. (1mk)

Anhydrous sodium carbonate