Name…………………………………………………………… Adm No. ……………………… Class……………………….. Signature………………… Date………………………

CHEMISTRY

PAPER

THEORY

2Hours

**TOP EVALUATION TEST-2016**

**JULY/AUGUST 2016**

**FORM 2**

**INSTRUCTIONS TO STUDENTS:**

* *Write your* ***name*** *and* ***admission number*** *in the spaces provided above.*
* ***Sign*** *and write the* ***date*** *of examination in the spaces provided.*
* *Answer* ***all*** *the questions in the spaces provided.*
* *All working* ***must*** *be clearly shown where necessary.*

***For Examiner’s Use Only:***

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Student’s score** |
| **1** | **06** |  |
| **2** | **12** |  |
| **3** | **20** |  |
| **4** | **11** |  |
| **5** | **05** |  |
| **6** | **13** |  |
| **7** | **13** |  |
| **Total** | **80** |  |

*This paper consists of 10 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

1. (a) Name the following laboratory apparatus. (3 marks)



Figure 1

**…………………………………………………………………………………………………………….**



Figure 2

**……………………………………………………………………………………………………………….**



Figure 3

**.........................................................................................................................................................................**

(b) Give the function of: (3 marks)

1. **.....................................................................................................................................................................**

2. **……………………………………………………………………………………………………………**

3. **…………………………………………………………………………………………………………….**

1. The following diagram shows the effects of heat on the physical states of substances.



 (a) Identify the processes represented by the letters A, B, C, D, E and F (3 marks)

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 (b) Name two substances that undergo the process labelled E and F. (2 marks)

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(c) Name a method that can be used to extract the following:-

 (i) Common salt from a salt solution. (1 mark)

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(ii) Paraffin from crude oil. (1 mark)

.............................................................................................................................................................

(d) A student separated liquid P (B.P 78°C) and liquid Q (B.P 100°C) wring the apparatus shown below.

(i) Name the apparatus labelled

(a) M **..........................................................................................................................**(1 mark)

  (b) R **.........................................................................................................................** (1 mark)

  (ii) State one function of the glass bead in apparatus labelled R (1 mark)

**....................................................................................................................................................**

(iii) What is the reading on the thermometer when the first jar drops of the distillate appeared in the beaker. (1 mark)

**..........................................................................................................................................................................**

  (iv) Which of the liquids remains in the flask. (1 mark)

........................................................................................................................................................................

1. Study the information in the table below and answer the questions that follow (The letters do not represent the actual symbols of the elements)

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Ionization Energy\_kJ/Mole | |
| Element | Electronic configuration | 1st ionization energy | 2nd ionization energy |
| A | 2.2 | 900 | 1800 |
| B | 2.8.2 | 736 | 1450 |
| C | 2.8.8.2 | 590 | 1150 |

(a)What chemical family do the elements A, B and C belong? (1mark)

………………………………………………………………………………………………………………

(b) Write the oxidation state of A and B. (1 mark)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………….

(c) Write the electronic structure of an ion of B and C. (2 marks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(d) Atoms of A, B, C are called divalent. Why? (2 marks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………….

(e) What type of bonding exists in (2 marks)

1. atoms of C?

…………………………………………………………………………………………….

1. chloride of B?

………………………………………………………………………………………………

(f)What is ionization energy? ( 1 mark)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(g)Explain the following:

1. The atomic radius of A is bigger than its ionic radius. (2 marks)

**……………………………………………………………………………………………………………………………………………………………………………………………………………………………….**

1. The 1st ionization energy of C is lower than of B. (2 marks)

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1. C is a better conductor than B. (2 marks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

(h)Write a chemical equation for the reaction of element B with: (3 marks)

1.Air

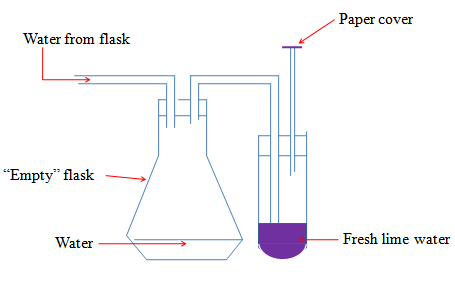
2.Chlorine gas

3.Water vapour

(i)State the uses of metals in this chemical family. (2 marks)

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1. Study the set up of apparatus below and then answer the questions that follow.



1. State the purpose of the experiment. (2 marks)

**………………………………………………………………………………………………………………………………………………………………………………………………………………………………..**

1. For what reason is the paper cover used? (1 mark)

…………………………………………………………………………………………………………..

1. Explain what happens when water enters the flask? (1 mark)

……………………………………………………………………………………………………………………………………………………………………………………………………………………

1. What is observed when the air is bubbled in the lime water (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………….…

(e) Identify the compound that forms: (3 marks)

(i)lime water

**……………………………………………………………………………………………..**

(ii)white precipitate

**…………………………………………………………………………………………….**

(iii)when the white precipitate dissolves

**………………………………………………………………………………………………………**

(f) Write the chemical equation for the reaction that tale place when: (2 marks)

(i) white precipitate is formed

(ii) white precipitate dissolves

5. (a) Define the following. Give an example for each. (4 marks)

1. Hygroscopic salts

………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Deliquescent salts

**……………………………………………………………………………………………………………………………………………………………………………………………………………………………….**

(b) 25cm3 of Sodium hydroxide solution was reacted with about 25 cm3 of dilute hydrochloric acid. This was with an intention to prepare a salt Y.

i) Name the method of preparing salt. Give a reason. (2 marks)

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ii) Name the salt that is formed following the reaction. (1 mark)

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iii) Write a full balanced chemical equation for this reaction. (2 marks)

iv) State two properties of the salt in a(ii) above. (2 marks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………….

(v) State two uses of the salt. (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………

6. About 2g of anhydrous copper (II)sulphate(VI)crystals is added into a clean test tube. Three drops of tap water is then added.

(a) What happens to the colour of anyhrous copper(II)sulphate(VI)crystals? (1 mark)

**………………………………………………………………………………………………………………………………………………………………………………………………………………**

(b) Account for (a) above. (2 marks)

**………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..**

(c) Write word and chemical equations for the reaction that takes place. (2 marks)

7. Below is a diagram shown how hydrogen can be prepared in the laboratory and the study of the reducing ction of hydrogen.

LiLIquid M

Zinc

granules

Q

Drying agent

K

Copper (II) oxide

To suction pump

Liquid S cold water

a) What is reduction? (1 mark)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………

b) Identify apparatus Q (1 mark)

………………………………………………………………………………………………………. (2 mks)

c) Suggest a suitable drying agent K. (1 mark)

**……………………………………………………………………………………………………..**

d) Name liquid M. (1 mark)

…………………………………………………………………………………………………….

e)Explain the chemical reaction taking place in apparatus Q. (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………..

(f) Name liquid S. (1 mark)

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(g) Give two chemical tests for liquid S. (2 marks)

**…………………………………………………………………………………………………………………………………………………………………………………………………..**

(h) Mention two uses of hydrogen gas. (2 marks)

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1. Write the chemical equation for the reaction. (2 marks)