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545/2  
Chemistry  
Paper2  
June/July 2019  
2 hours

UCE MOCK EXAMINATION 2019  
UGANDA CERTIFICATE OF EDUCATION  
CHEMISTRY  
PAPER 2  
2 HOURS

**INSTRUCTIONS TO CANDIDATES:**

- *This paper consists of **two** sections **A** and **B**.*
- *Section **A** is compulsory*
- *Attempt only **two** questions in section **B***
- *Answers to questions in section **A** **MUST** be written in the spaces provided.*
- *Answer **ALL** questions in both sections **A** and **B**.*
- *Answers to questions in section **B** **MUST** be written on the answer sheets provided.*

**SECTION A**  
All questions are compulsory

1. (a) Name **two** types flames that a Bunsen burner can produce. (01mk)

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b) State;

- i) The condition (s) under which each of the Bunsen burner flames that you have named in (a) is produced; ( 1mk)

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- ii) Which one of the flames that you have named in (a) is more suitable for use. ( ½ mks)

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- c) Give a reason for your answer in (b) (ii). ( ½ mks)

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d) The gas which is used as a fuel in the Bunsen burner is a hydrocarbon of molecular formula  $C_4H_{10}$ ,

- i) Name the gas. (01mk)

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- ii) State the homologous series to which the hydrocarbon belongs. (01mk)

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2. (a) Water was added to sodium peroxide;

- i) State what was observed; (02mks)

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- ii) Write equation for the reaction which took place. (1 ½ mks)

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b) State;

- i) How the gaseous product from the reaction between sodium peroxide and water can be tested? ( ½ mk)

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- ii) **Two** uses of the other product of reaction between sodium peroxide and water. (01mk)

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3. (a) Name **one** substance in each case, which is;

- i) a carbonate that shows no change in mass when heated. ( ½ mk)

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- ii) a compound that when heated turns directly into gas (es) without first melting. (01mk)

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- iii) a nitrate, which when heated, produces oxygen as the only gaseous product; ( ½ mks)

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b) Write equation for the reaction that would take place if each of the following mixtures was heated;

i) Iron and sulphur. (1 ½ mks)

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ii) Zinc and dilute sulphuric acid (1 ½ mks)

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4. (a) Magnesium powder was added to copper (II) oxide and the mixture heated;

i) State what was observed; (02mks)

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ii) Write equation for the reaction that took place. (1 ½ mks)

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b) (i) If the procedure in (a) was repeated using calcium oxide instead of copper (II) oxide, state how calcium would be affected. (½ mk)

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ii) Give a reason for your answer in (b) (i). (01mk)

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5. (a) (i) Define the term **"alloy"** (01mk)

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ii) Name **one** common alloy of iron. ( ½ mk)

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iii) Give **two** reasons why the alloy you have names in (ii) is more often used than iron itself. (01mk)

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b) Name the major components of the following alloys;

i) Solder (01mk)

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ii) Duralumin (01mk)

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c) State **one** use of duralumin ( ½ mk)

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6. The atomic numbers of elements **X**, **Y** and **Z** are **11**, **15** and **17** respectively;

a) Write the electronic configuration of;

X : .....

(01mk)

Y: ..... (01mk)

Z: .....

(01mk)

b) State the period in the periodic table to which each of the three elements belongs.  
(01mk)

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c) Element **Z** can react with both **X** and **Y** to form solid products **Q** and **R** respectively;

i) Identify which **one** of the products would have a lower melting point.  
(01mk)

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ii) Give a reason for your answer in (c) (i) above. (01mk)

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7. In an experiment to study the reaction of lead (II) and copper (II) ions, excess dilute ammonia solution was added to an aqueous solution containing a mixture of copper (II) and lead (II) ions and the resultant mixture filtered;

a) State the colour of the;

i) Residue (01mks)

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ii) Filtrate (01mk)

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b) Write;

i) The formula of the cation that was in the filtrate; ( ½ mk)

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ii) Equation for the reaction that resulted into formation of the residue;  
(1 ½ mks)

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c) If the experiment above was repeated using excess dilute sodium hydroxide solution; identify the cation that would appear in the; (01mk)

i) Residue (01mk)

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ii) Filtrate (01mk)

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- $$2\text{KOH}_{(\text{aq})} + (\text{NH}_4)_2\text{SO}_{4(\text{aq})} \longrightarrow \text{K}_2\text{SO}_{4(\text{aq})} + 2\text{H}_2\text{O}_{(\text{l})} + 2\text{NH}_{3(\text{g})}$$

[illegible]

- [illegible]

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neutrons are shown in the table below;

| Particle | Mass number | Number of electrons | Number of neutrons |
|----------|-------------|---------------------|--------------------|
| Q        | 14          | 7                   | 7                  |
| R        | 24          | 10                  | 12                 |
| T        | 31          | 15                  | 16                 |
| W        | 36          | 18                  | 18                 |
| X        | 39          | 19                  | 20                 |
| Y        | 40          | 18                  | 22                 |
| Z        | 41          | 19                  | 22                 |

Identify which one of the is or are;

a) Isotopes (01mk)

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b) An anion (01mk)

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c) A cation (01mk)

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d) Atoms of elements in the same group of the periodic table. (01mk)

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e) The atom of an inert gas. (01mk)

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10. (a) Name **one** allotrope of carbon which is;

i) Amorphous ( ½ mk)

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ii) Crystalline ( ½ mk)

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b) State **one** use of each of carbon allotropes that you have named in (a) (02mks)

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- c) Name **one** element other than carbon which shows allotropy (01mk)

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## SECTION B

Attempt only **two** questions

11. (a) Define the term "**enthalpy of combustion**" (01mk)

b) (i) Draw a labeled diagram of the set up of apparatus that can be used to determine the enthalpy of combustion of ethanol in the laboratory. (04mks)

ii) State why the enthalpy of combustion of ethanol obtained experimentally using the kind of apparatus that you have drawn is normally found to be less than the literature values and suggest **two** ways by which the experimental value can be improved. (02mks)

c) State **two** practical applications of enthalpies of combustion. (02mks)

d) When 4.0g of ammonium nitrate,  $\text{NH}_4\text{NO}_3$  was dissolved in  $96.0\text{cm}^3$  of water, the temperature of the water dropped from  $27.0^\circ\text{C}$  to  $24.1^\circ\text{C}$ .

i) Give a reason why there was a drop in the temperature of the water. (1mk)

ii) Calculate the enthalpy of solution of ammonium nitrate  
( $H=1$ ,  $N=14$ ,  $O=16$ , density of water is  $1\text{gcm}^3$ , and heat capacity of ammonium sulphate solution is  $4.2\text{Jg}^{-1}\text{C}^{-1}$ ) (05mks)

12. (a) (i) State the conditions under which hydrochloric acid reacts with potassium manganate (VII) during laboratory preparation of chlorine; and write equation for the reaction leading to the formation of chlorine. ( $2\frac{1}{2}$  mks)

- ii) Explain how a pure dry sample of chlorine can be obtained during its preparation as stated in (a) (i) (No diagram is required) (03mks)
- b) State and explain how chlorine is prepared on a large scale using sodium chloride (No diagram is required) (05mks)
- c) Dilute hydrogen chloride solution was added drop wise to lead (II) oxide until in a small excess and the mixture allowed to stand
- i) Stat what was observed and write equation for the reaction that took place. (03mks)
- ii) From the reaction in (c) (i), deduce any conclusion that can be made concerning the composition of hydrogen chloride. (1 ½ mks)
13. (a) Outline how a sample of a concentrated solution of ethanol can be prepared by fermentation of glucose  $C_6H_{12}O_6$  (No diagram is required but your answer should include equation of reaction) (05 mks)
- b) Briefly describe and explain how a sample of ethene can be prepared from ethanol using sulphuric acid (Your answer should include conditions and equations but no diagram is required) (4 ½ mks)
- c) Write equation to show the reaction of ethene leading to formation of;
- i) 1,2 –dibromo ethane (1 ½ mks)
- ii) Polyethene (01mk)
- iii) Water and carbon dioxide (1 ½ mks)
- d) State **one**;
- i) Use of ethanol other than preparation of ethene (½ mk)
- ii) Use of polyethene (½ mk)
14. (a) Write the chemical name and formula of one oxide and one carbonate, which are some of the major ores of iron. (02mks)
- b) During the extraction of iron, the ores are first roasted in air before being transferred into the Blast furnace. State the purpose of roasting the iron ores in air. (01mk)
- c) Name;
- i) The major impurity in the ore (½ mk)
- ii) Two substance which are fed into the blast furnace together with roasted iron ore. (01mk)

- iii) Any other substance that is also fed into furnace; and describe where from the substance is let into the furnace. (01mk)
- d) Using equations only outline reaction which take place inside the Blast furnace up to;
- i) Reduction of the ore (3 ½ mks)
- ii) Removal of the major impurity in the ore. (02mks)
- e) State the importance of slag during extraction of in the furnace. (01mk)
- f) Give a reason why iron is extracted by chemical reduction whereas sodium is extracted by electrolysis. (01mk)
- g) When excess iron filings was added to 125 cm<sup>3</sup> of a solution containing 0.5 mole of copper (II) sulphate per dm<sup>3</sup>, and the experiment allowed to stand until there was no further change, a brown solid formed on the iron filings.  
Determine the maximum mass of the brown solid that was formed. (**O=16, S=32, Fe=56 and Cu=64**) (02mks)

END