

Name.....

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

School.....

Date .....

Candidate's Signature.....

233/1

**CHEMISTRY**

**Paper 1**

**JULY/AUGUST 2012**

**Time: 2 HOURS**

**MARAKWET WEST DISTRICT JOINT EVALUATION TEST ( MAWESSE) – 2012**

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

233/1

**CHEMISTRY**

**Paper 1**

**JULY/AUGUST 2012**

**Time: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index numbers in the space provided above.
2. Sign and write the date of examination in the space provided above.
3. Answer all the questions in the spaces provided in the question paper.
4. Mathematics tables and silent electronic calculators may be used.
5. All working **MUST** be clearly shown where necessary.
6. This paper consists of 14 printed pages. Candidates should confirm the 14 printed pages are there.

*This paper consists of 4 printed pages.  
Candidates should check the question paper to ensure that all  
pages are printed as indicated and no questions are missing*

1. a) When lead (II) carbonate reacts with dilute hydrochloric acid, very little carbon (iv) oxide is produced (2 mks)

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b) When hydrogen chloride gas is dissolved it in water, the solution formed turns blue litmus paper but there is no effect on blue litmus paper when the gas is dissolved in carbon tetra chlorid ( ccl<sub>4</sub>) (2 mks)

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2. Element A has atomic mass 23 element B atomic mass 7 and also have 12 neutrons and 4 neutrons respectively.

a) Write the electron arrangement of A and B. (1mk)

A: .....

B: .....

b) Which element has higher ionization enegery? Explain. (2mks)

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3. a) Two experiments were carried out as follows and the volume of hydrogen gas evolved measured at intervals of 10 seconds for 100 seconds.

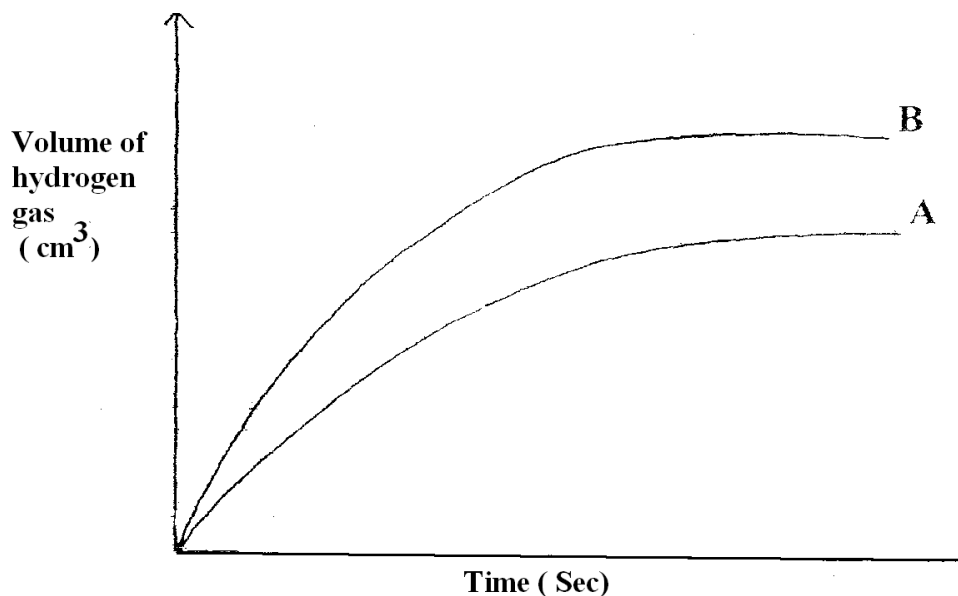
(i) 8 cm of magnesium ribbon was added to 1M hydrochloric acid.

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(ii) 8cm of magnesium ribbon was added to 0.5M hydrochloric acid.

Graphs of volume of hydrogen gas evolved against time were plotted.

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b) a) Which of the graphs was obtained for reaction(i) ? Explain. (2mks)

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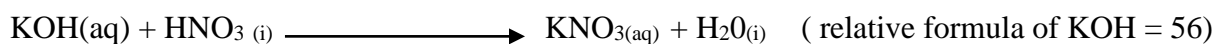
b) Explain the general shape of the graphs. (1mk)

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4. Diagrams of potassium hydroxide were dissolved in distilled water to make 100cm<sup>3</sup> of solution. 50cm<sup>3</sup> of the solution required 50cm<sup>3</sup> of 2.0M nitric acid for complete neutralization. Calculate the mass D of potassium hydroxide.



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Painting , oiling, galvanizing and or tin plating are methods of rust prevention

5. a) Explain the similarity of these methods in the ways they prevent rusting. (1mk)

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b) State a chemical test for the gas evolved. (1mk)

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9. Write ionic equations for electrolysis of dilute sulphuric acid using platinum electrodes at: (2 mks)

i) Anode:.....

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ii) Cathode:.....

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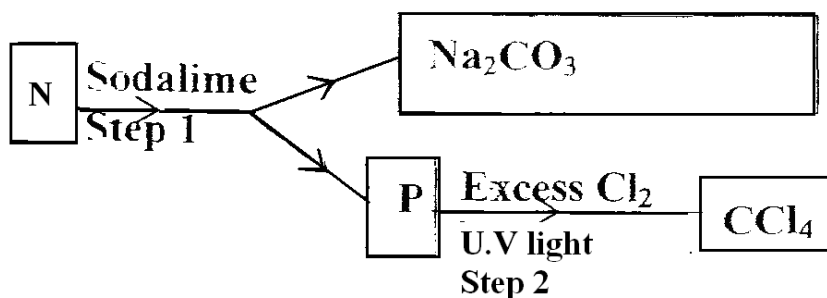
10. An atom X contains 90% of  $^{16}_8\text{X}$  isotope. Calculate the relative atomic mass of X. (2mks)

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11. During the electrolysis of dilute sulphuric (VI) acid the volume of hydrogen gas collected is twice the volume of oxygen gas. Using half equations justify the above statement. (2mks)

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12. Study the flow chart below and answer the questions that follow.



a) Identify N and P

N .....

P .....

b) What name is given to the type of halogenation / Chlorination reaction in step 2 (1mk)

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13. M grammes of a radioactive isotope decayed to 5 grammes in 100 days. The half – life of the isotope is 25 days.

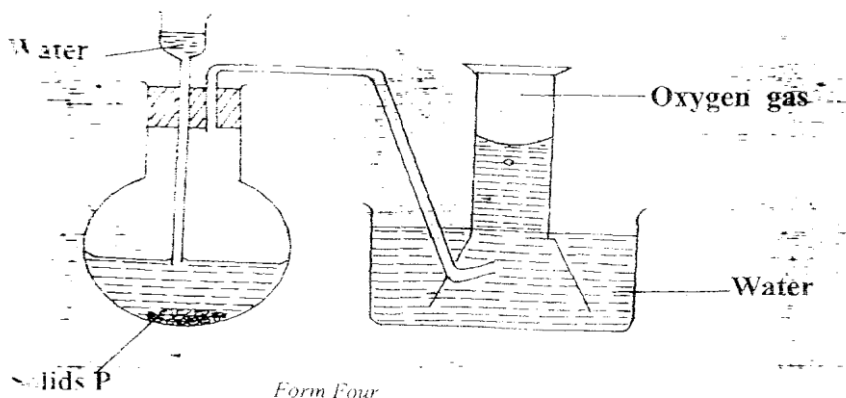
a) What is meant by half – life?

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b) Calculate the initial mass of Mass of M of the radioactive isotope. (2mks)

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14. The diagram below represents set – up that can be used to prepare and collect oxygen gas.



a) Name solid P:.....

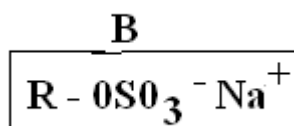
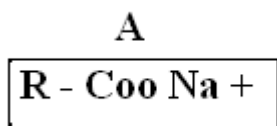
b) What property of oxygen makes it possible for its collection as indicated by the diagram.

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c) Explain why it is important not to collect any gas for the first few seconds of the experiment. (1mk)

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15. The compound A and B below are cleansing agents. Use it to answer the question that follow.



- i) Identify cleaning agents A and B  
 A.....  
 B .....

- ii) State two disadvantages of cleansing agent B over A.  
 .....  
 .....

16. The standard electrode potential of four half – reactions are.

1.  $\text{Sn}^{2+}_{(\text{aq})} + 2\text{e} \longrightarrow \text{Sn}_{(\text{s})} \quad E^\theta = -0.14 \text{ V}$
2.  $\text{Fe}^{3+}_{(\text{aq})} + \text{e}^- \longrightarrow \text{Fe}^{2+}_{(\text{aq})} \quad E^\theta = + 0.77\text{V}$
3.  $\text{V}^{2+}_{(\text{aq})} + 2\text{e} \longrightarrow \text{V}_{(\text{s})} \quad E^\theta = - 1.20\text{V}$
4.  $\text{Br}_{2(\text{aq})} + 2\text{e} \longrightarrow 2\text{Br}_{(\text{aq})} \quad E^\theta = + 1.07\text{V}$

- i) Identify the strongest reducing agent.  
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 .....  
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- ii) Calculate the electrode potential for the electrochemical cell constuted from half – cell  
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17. i) Draw the structural formula of of organic compound with the formula  $\text{C}_5\text{H}_{10}\text{O}_2$  giving its name. (2mk)

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- ii) To which homologous series does the compound drawn above belong. (1mk)  
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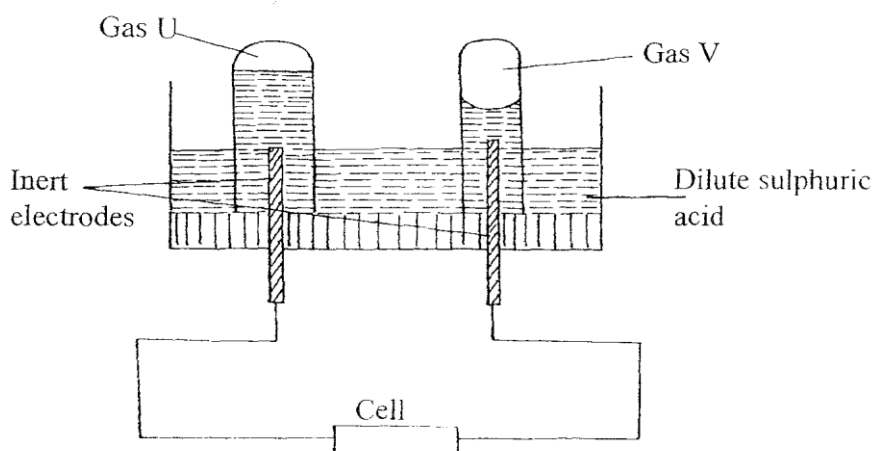
18. Use the bond energy value given below for the question that follows.

|       |                                     |
|-------|-------------------------------------|
| Bond  | Bond energy ( $\text{KJmol}^{-1}$ ) |
| H – H | 432                                 |

|       |     |
|-------|-----|
| C = C | 610 |
| C - C | 346 |
| C - H | 413 |

Determine the enthalpy change for the conversion of butane of butane by hydrogen. (3mks)

19. The figure below shows the electrolysis of dilute sulphuric acid.



i) On the diagram, label the cathode and the anode.

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ii) Name the gases

U .....

V .....

20. Given the equation for reaction  $2\text{Al}_{(s)} + 3\text{Cl}_{2(g)} \longrightarrow 2\text{AlCl}_{3(s)}$ . Calculate.

Volume of chlorine at (r.t.p) required to react with 3g of Aluminium ( Molar gas volume at r.t.p = 24 litres, Al = 27, Cl = 35.5)

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21. An element Q has relative atomic mass of 88. When a current of 0.5 amperes was passed through the fused chloride of Q for 32 minutes and 10 seconds, 0.44g of Q were deposited at the cathode. Determine the charge on an ion of Q. ( 1 Faraday = 96500C) (3mks)

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22. A mixture of ethanol and pentane is miscible the mixture can be separated, first by adding water. Explain why water is used and how ethanol, Pentane and water can subsequently be separated. (3mks)

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23. Two gases A<sub>2</sub> and B<sub>2</sub> react to form a gaseous compound AB<sub>3</sub> according to the following equation.



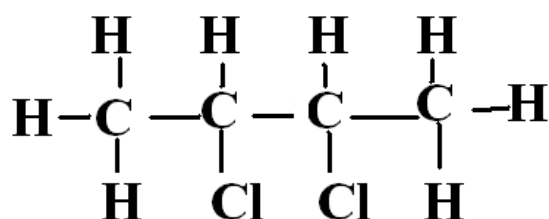
a) Draw an energy level diagram for the reaction. (2mks)

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b) State three ways in which the yield of AB<sub>3</sub> can be increased. (3mks)

An organic compound T reacts with chlorine in presence of U.V light to form compound U. The structural formula of compounds U is shown below.

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24. Structural formula of compound u is shown below.



Name organic compound T and draw its structural formula. (2mks)

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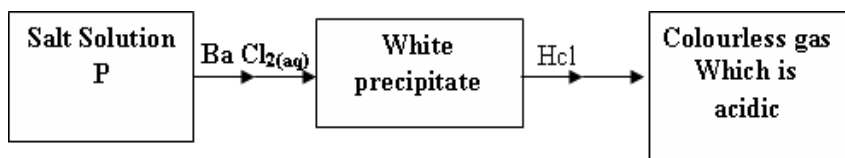
25. a) What do you understand by the term molar enthalpy of displacement of an element?(1mk)

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b) During displacement reaction, excess iron powder was added to 25cm<sup>3</sup> of 0.5 M copper (II) sulphate solution. The temperature rose from 18.5 C to 33.0<sup>0</sup>C. Calculate the molar enthalpy of displacement of copper in (II) sulphate solution ( Specific heat capacity is 4.2 Jg<sup>-1</sup>K<sup>-1</sup>, Density of the solution = 1.0g/ cm<sup>3</sup>)

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26. Study the scheme below and use it to answer the questions that follows.



Write down the formulae of two possible anions present in salt solution P. (2mks)

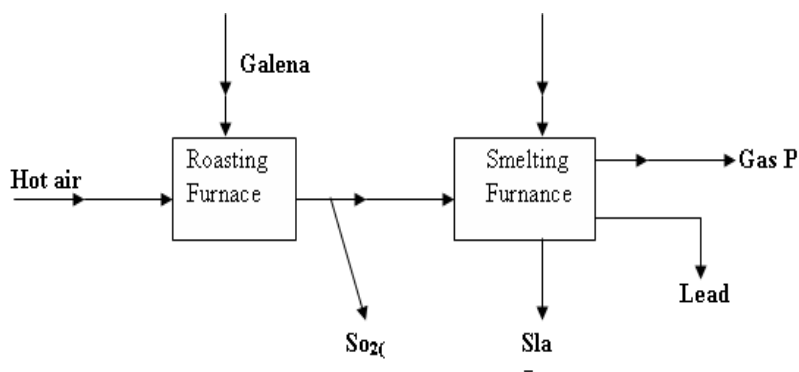
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27. During the extraction of lead from its ores one of the main ore used is Galena.



i) Write an equation for the reaction in roasting furnace. (1mk)

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ii) Name gas P (1mk)

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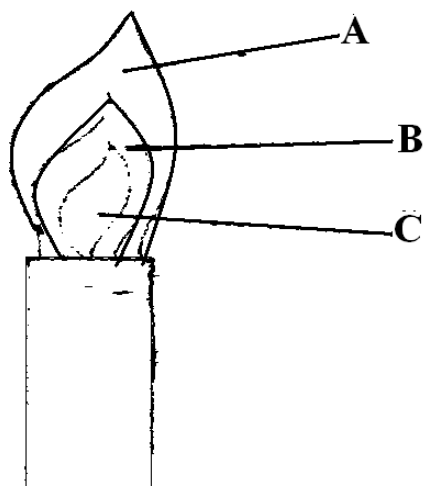
iii) State one use of lead metal (1mk)

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28. The diagram below shows a Bunsen Burner when in use.



Which of the labeled parts is used for heating? Give a reason.

29. The table below shows solubilities of two salts M and N at different temperatures. Study it and answer the questions that follow.

| Temperature (C <sup>0</sup> )                | 30   | 90   |
|--|------|------|
| Solubility M in g / 100g of H <sub>2</sub> O | 25.0 | 64.0 |
| Solubility of N in g/100 g H <sub>2</sub> O  | 32.5 | 48.0 |

A mixture of 55g of salt M in 100g of water and 30g of salt N in 100g of water were cooled from 90<sup>0</sup> C. Calculate the mass of salt of salt that crystallize out. (2mks)

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