Name: ………………………………………………………………………………………. Class: ………… Adm.No. ……………

**CHEMISTRY**

**THEORY**

**Paper 1**

**March – April 2017**

Time: 2 hours

**MOKASA JOINT EXAMINATION**

**MARCH – APRIL 2017**

**Kenya Certificate of Secondary Education**

**CHEMISTRY**

**PAPER 1**

**INSTRUCTIONS TO CANDIDATES**

* *Answer* ***ALL*** *the questions in the spaces provided.*
* *Electric calculators fx – 82 ms is allowed.*
* *All working must be clearly shown.*

**FOR EXAMINER USE ONLY**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate’s score** |
| 1 – 31 | **80** |  |

1. When Sulphur is heated the following reaction takes place.

A

B

 (a) Name process A and B. **(1 mark)**

 A ……………………………………………………………………………………………………………….

 B ……………………………………………………………………………………………………………….

 (b) State one application of the process A. **(1 mark)**

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(c) Name one common characteristic of salts which undergo process A when they are heated in a boiling tube. **(1 mark)**

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2. (a) A student was stung by a bee outside the chemistry lab. The teacher applied a

solution of ammonia to the place. Explain why. **(2 marks)**

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 (b) Explain why it is not advisable to use a solution of potassium hydroxide.

 **(1 mark)**

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3. A sample of water in a beaker was found to boil at 1050C at sea level. Explain this observation. **(1 mark)**

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4. State the mode of conduction of electricity in the following substances. **(2 marks)**

1. Copper rod. ……………………………………………………………………………….
2. Molten copper (II) oxide ……………………………………………………………………………….

5. Dry ammonia was passed over heated copper (II) oxide in a combustion tube.

 (a) State and explain the observation that was made. **(2 marks)**

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 (b) Write a balanced chemical equation for the reaction above. **(1 mark)**

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6. An element X has 2 isotopes and . If their percentage abundance is 69% and 31% respectively find the R.A.M of X.  **(2 marks)**

7. The melting point of phosphorous trichloride is and that of sodium chloride is 8010C. Explain the huge difference in their melting points. **(2 marks)**

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8. Explain how the “greenhouse effect” occurs. **(2 marks)**

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9. Use dots (•) or crosses (x) to show bonding in the following molecules. **(2 marks)**

 (a) Silicon hydride

 (b) hydroxonium ion

10. Starting with copper (II) oxide describe how CRYSTALS of copper (II) sulphate can be made. **(3 marks)**

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11. The table below shows the first ionization energies of element X and Y.

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| --- | --- |
| Element  | Ionization energy kJ/mole |
| X | 494 |
| Y | 736 |

 (a) Define the term first ionization energy. **(1 mark)**

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(b) Compare the reactivity of X and Y. Explain your answer. **(2 marks)**

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12. (a) Write the chemical formular of the main compound in Bauxite. **(1 mark)**

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 (b) Name the chief impurities found in chief ore of aluminium. **(1 mark)**

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13. (a) Explain why it is not proper to cook using charcoal in an enclosed room.

 **(2 marks)**

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(b) When carbon (IV) oxide is bubbled through calcium hydroxide for a long time two types of reactions occur; write the equation for each of the reaction. **(2 marks)**

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14. A jar full of moist chlorine was inverted over a jar of hydrogen sulphide as shown below.

Moist chlorine

Hydrogen sulphide

 (a) State the observation made.  **(1 mark)**

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(b) Write the equation for the reaction and show using oxidation no. that the reaction above is a redox. **(2 marks)**

15. Chlorine was bubbled through a solution of potassium iodide;

 (a) State the observation made. **(1 mark)**

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 (b) Write an ionic equation for the above reaction. **(1 mark)**

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16. The solubility of Iron (II) sulphate at 220C is 15.65/100g of water. Calculate the mass of Iron (II) sulphate crystals in 90g of saturated Iron (II) sulphite solution. **(3 marks)**

17. The diagram below was used to electrolyze molten copper (II) chloride using graphite electrodes at s.t.p.

B

A

 Heat

 (a) Explain the role of heat on the above set up. **(1 mark)**

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 (b) Name electrode A and B. **(1 mark)**

 A ……………………………………………………………….

 B ……………………………………………………………….

(c) If 96500 C of electricity was used during electrolysis of molten copper (II) chloride above. Work out the volume of chlorine liberated at s.t.p. (IF =96500C).

 **(3 marks)**

18. Copper (II) sulphate reacts with Barium chloride according to the following equation:

 Calculate the temperature change when 900cm3of 1M and 600cm3 of 1M copper (IV) sulphate were reacted. (s.h.c = 4.2kJ/kg/K.  **(3 marks)**

19. When 17.2 g of hydrated calcium sulphate was heated to a constant mass, 13.6g of the residue was obtain. Find the value of n in . **(2 marks)**

 (Ca = 40, S = 32, O = 16, H = 1)

20. (a) Define the term allotropes. **(1 mark)**

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(b) Explain how diamond and graphite can be proved to be allotropes. **(2 marks)**

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21. In an experiment, ammonium chloride was heated in a boiling tube with a moist red and blue litmus paper at the mouth of test tube. State and explain the observation made.

 **(3 marks)**

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22. 100cm3 of gas R diffuses through a porous pot in 110 seconds while some volume of CO2 diffuses through in 165 seconds. Find the R.M.M of gas R. (C = 12, O = 16) **(3 marks)**

23. 250cm3 of 1M HCl was reacted with 5cm of magnesium ribbon. The resulting solution required 15.0cm3 of IM Na OH for complete neutralization. Determine the mass of Magnesiumribbon used. (Mg = 24). **(3 marks)**

24. Name the process that takes place when;

 (a) fat or oils are boiled using alkalis. **(1 mark)**

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 (b) chlorine is reacted with methane **(1 mark)**

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25. Ethanol and dimethylether have formulae Explain why ethanol boils at 78.20C and dimethyl ether has a boiling point -240C. **(2 marks)**

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27. Below is part of a synthetic polymer.

 H H H H H

 C C C C C

 H H H

Determine the number of monomers in the polymer above give the RFM of the polymer

 is 208000 &has a formular of . **(3 marks)**

(C = 12, H = 1)

28. Calculate the enthalpy change for the combustion of ethyne using the equations below.

 **(3 marks)**

 = -394kJ/mol

 = -286kJ/mol

 = +226 kJ/mol

29. (a) A mass of X grammes of radioactive isotope active decay to 5 grams in 100 days.

If the half-life is 25 days, calculate the initial mass. **(2 marks)**

 (b) State two applications of radioactivity. **(2 marks)**

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30. State one way of disposing radioactive substances. **(1 mark)**

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31. Study the chart below and answer the questions that follow.

A

Rock salt

Lead (II) nitrate

White solid R

Hydrogen

chloride

KMnO4

Solid S

Iron

 Gas T

 (a) Name reagent used in step A. **(1 mark)**

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

 (b) Write the ionic equation for formation of white solid R. **(1 mark)**

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 (c) Write an equation for formation of solid S. **(1 mark)**

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