233/1

Chemistry

Paper 1

(Theory)

july/august 2016

2 hours

KAKAMEGA EAST SUB –COUNTY

FORM FOUR JOINT EVALUATION TEST

CHEMISTRY PAPER 1

2 HOURS

1. The table below shows the PH values of solution P, Q, R and S

Solution PH value

P 2.0

Q 5.0

R 9.0

S 13.0

a. which solution represents

i) strong acid (1/2mark)

ii) a weak base (1/2mark)

b) identify two solutions that would react with zinc II hydroxide (1mark)

2. An element T has isotopes 3717T and 3517T

a. what are isotopes (1mark)

b.if the relative abundance of isotope3717T is 25% determine the relative atomic mass of T (2marks)

3. Name the process which takes place when;

i)hydrated sodium carbonate loses some of its water of crystallization when exposed to the atmosphere (1mark)

ii) white sugar crystals change to black mass when mixed and warmed with concentrated sulphuric VI acid(1mark)

iii) starch is converted to ethanol (1mark)

4. Drop a dot (.) and cross (×) diagram to show bonding in a molecule of carbon II oxide (Atomic number of C=6 and O=8) (2marks)

5.Describe how a mixture of copper II oxide ,ammonium chloride and lead II nitrate can be separated in the laboratory (3marks)

6. Ethanoic acid reacts with propanol as shown by the equation below.

CH3COOH + CH3CH2CH2OH CH3COOCH2CH2CH3 + H2O

1. What name is given to the forward reaction (1 mark)
2. Name the organic product formed.

7. a) During electrolysis, an electric current of 4A was passed through an electrolyte for 60 minutes.Calculate the quantity of electricity that passed through the electrolyte in coulombs.

b) If the charge was passed through aqueous copper (II) sulphate, calculate the mass of copper metal that would be deposited. (Cu = 63.5 IF = 96500C) (2 marks)

8. Graphite and diamond are examples of allotropes of carbon .Name one other element which exhibits allotropy

9 a) Complete the nuclear reaction below. (1mark)

23490Th 23491 Pa+

b) the half – life of 13153I is 8 days. Determine the mass of the isotope that would remain if 100 grams decayed for 48 days.

10. State Charles s law

b) A certain mass of a gas occupies 250cm3 at 18 C and 740mmHg.Calculate the volume the gas will occupy at 30 C and pressure of 750mmHg.

11. Study the flow chart below and answer the question that follow

Black solid C+dilute Nitric V acid

Solution D NH3(aq)

Blue precipitate

NH3(aq)

Deep blue solution

a) identify solid C (1mark)

b) write an equation for the formation of solution D (1mark)

c) write the formular of the ion responsible for the deep blue solution (1mark)

12.3.18g of monovalent metal M carbonate reacted with excess hydrochloric acid to evolve 672cm3 of carbon IV oxide at stardand temperature and pressure (s.t.p) .determine the relative atomic mass of M(Molar gas volume at s.t.p=22.4dm3,C=12.0,O=16.0) 3marks)

13.why is it not advisable to use a luminous flame of the Bunsen burner for heating in the laboratory (1mark)

14.sodium and aluminium metals belong to 3 of the periodic table

a)write the formulae of the chlorides of the two metals (1mark)

b)state and explain the observation made sodium hydrogen carbonate is added to solutions of two chlorides respectively (2marks)

15.a)name two ores which iron is extracted (1mark)

b)a part from making iron sheets for roofing,state two other uses of iron metal (1mark)

16.a)state Le Chateliers principle (1mark)

b)the equation below represents the formation of ammonia in the haber process

N2(g)+3H2(g) 2NH3(g) H=-92kjmol-1

i) state and explain the effect of the following on the yield of ammonia, increasing in pressure (2marks)

ii) catalyst (2marks)

17.use the information below the equation that follow

H0combustion -1560kjmol-1

H0combustion hydrogen (hydrogen) -286kjmol-1

H0combustion graphite (graphite) -393kjmol-1

Calculate the standard enthalpy of formation of ethane (3marks)

18. During the laboratory preparation of chlorine, manganese IV oxide is reacted with hydrochloric acid to produce chlorine gas

a) write the equation for the reaction between manganese IV oxide and hydrochloric acid (1mark)

b) what is the role of manganese IV oxide in this reaction?

19. The molecular formular of hydrocarbon is given as C4H10

a) what is a hydrocarbon (1mark)

b) draw and name two isomers of the above hydrocarbon (2marks)

20. When a marble chips were reacted with 1M hydrochloric acid, carbonIV oxide was evolved at a moderate rate. When the marble chips were crushed into powder and reacted with 1M hydrochloric acid, the rate of evolution of carbon IV oxide increased

Explain this observation (2marks)

21.a)using a balanced equation explain how temporary water hardness is removed by boiling (2marks)

b) state one disadvantages of using hard water for washing (1mark)

22. Magnesium and calcium belong to group 2 of the periodic table.to what chemical family do they belong to? (1mark)

23.5.4g of Pb(NO3)2 was heated strongly in an open crucible until their was no further change

a) write a balanced equation for the reaction that took place (1mark)

b) calculate the mass of the residue left

(Pb=207, N=14.0, O=16.0) (2marks)

24.a)the table below shows the atomic and ionic radii of elements that belong to the same group

Element Atomic radius (6m) Ionic radius (nm)

W 0.137 0.066

X 0.090 0.031

Y 0.174 0.099

State with a reason whether the elements are metals or non-metals (2marks)

b) Identify with a reason the most reactive element (2marks)

25. Explain why solid lead II bromide does not conduct an electric current whereas molten does conduct (2marks)

26.describe how the following reagents can to prepare lead II sulphate .solid sodium sulphate,solid lead II carbonate, dilute nitric V acid and distilled (3marks)

27. a) state Gay-Lussa’s law (1maks)

b)an initial volume of 80cm3 of a mixture of propane (C3H8) gas and excess oxygen was ingited in an experiment. The final volume was cooled and bubbled through aqueous sodium hydroxide. The final volume was reduced by 30cm3.Determine the composition of the original mixture (2mks)

28. Draw and name two isomers of pentyne (2mks)

END