KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

BAHATI GIRLS HIGH SCHOOL

CHEMISTRY

PAPER 1

MARKING SCHEME

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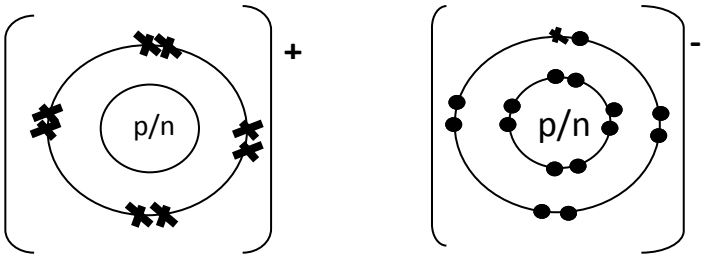
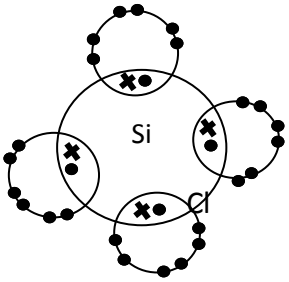
BAHATI GIRLS HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016
QUESTION PAPER 1
MARKING SCHEME

1. (a) 2,8,8
   (b) 2,8,2
2.
   - Manufacture of CO_2
   - Manufacture of sodium carbonate
   - Used in an aqueous solution as an anti-acid taken orally for treatment of acidity in the stomach
   - Used as a baking powder/used to bake bread
   - Used in fire extinguishers
3. (a) because it reacts with HCl(g) to form $CaCl_2$ + water
   (b) concentrated sulphuric acid
4. (a) Na + Cl $\longrightarrow$ NaCl
   Let (x) represent Na atoms and ( ) represents chlorine atoms



   (b) Si + Cl $\rightarrow$ $SiCl_4$
   Let (x) represents Si atoms (.) chlorine atoms



5. (a)
   (i) $ZnO_{(S)} + H_2SO_{4(aq)} \rightarrow ZnSO_{4(aq)} + H_2O_{(l)}$
   (ii) $ZnO_{(S)} + 2NaOH_{(aq)} \rightarrow Na_2Zn(OH)_{4(aq)}$
   (b) it is amphoteric
6. (a) 2+S=0
   S= -2
   (b) 2+2S-6=0
   S= +2
7. No. Of moles of HCl in $40cm^3$ of 2M HCl
   $= \frac{40cm^3 x 2M}{1000}$
   =0.08moles
   Mass of HCl in 0.08moles = 36.5 x 0.08
   = 2.92g
   4g of the XCO_3 reacts with 2.92g 0f HCl.
   X + 60g of XCO_3 reacts 2 x 36.5g of HCl
   2.92(X+60)g=4x2x36.5g
   2.92X+175.2 = 292

2.92X=292-175.2

=116.8

X= 116.8/2.92

=40

8. (a) deliquescent substance is a salt that absorbs water from the atmosphere and dissolves in it whereas inflorescent substance is a salt which when exposed to the atmosphere decomposes to release its water of crystallisation to the atmosphere

(b) used as drying agents for wet gases/test presence of water

9. (a)

(i) Isotopes are atoms with same number of protons/atomic numbers but different number of neutrons/mass numbers

(ii) Mass number is the total number of number of protons and neutrons in an atom.

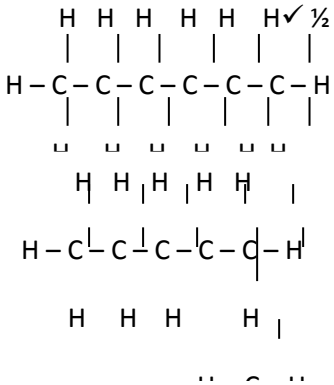
(b) P_2S_3

10. (a) malleable

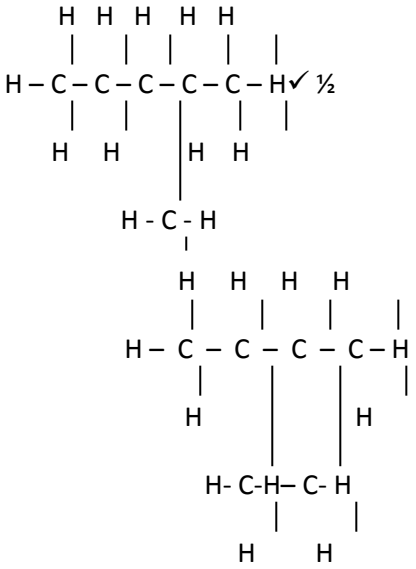
(b) Activation energy

(c) Weak van der waals forces

11.



2-methyl pentane



3 methyl pentane

12. (a) $Fe_{(s)} + Cu^{2+}_{(aq)} \rightarrow Fe^{2+}_{(aq)} + Cu_{(s)}$

(b) $\Delta T = 49.6^0C - 43.7^0C$

$=5.9^0C$

Heat evolved = MCΔT

95/100 x 4.2 x 5.9KJ

=2.354KJ

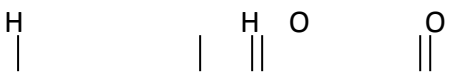
5.83g of copper produced 2.354KJ

∴63.5g (molar mass of Cu) produces

$$\frac{2.354KJ \times 63.5g}{5.83g}$$

=25.64KJ/mol

13. (a)



(b) Manufacture of nylon – used in clothing, ropes, in fishing lines.

14. (a) allotropy is the existence of an element in more than one form without change of state

(b) (i) graphite

(ii) – it is a lubricant because layers slide over each other

– a good conductor of both heat and electricity because it has delocalised/mobile electrons

15. Ethanol is soluble in water while pentane is not

- When water is added to the mixture, two layers are formed: top layer of pentane and bottom layer of ethanol and water can be separated using simple distillation since the boiling points of water and ethanol are very much different

16. Reducing agent is $Cr_2O_7^{2-}$ this is because it oxidise SO_2 to SO_4 i.e. oxidation of of S in SO_2 is +4 while that of S in SO_4^{2-} is +6.

17. $\frac{RA}{RB} = \sqrt{\frac{MMB}{MMA}}$

$\therefore \frac{RO_2}{RSO_2} = \sqrt{\frac{MMSO_2}{MMO_2}}$

$\therefore \frac{RO_2}{RSO_2} = \sqrt{\frac{64}{32}}$

$=1.41$

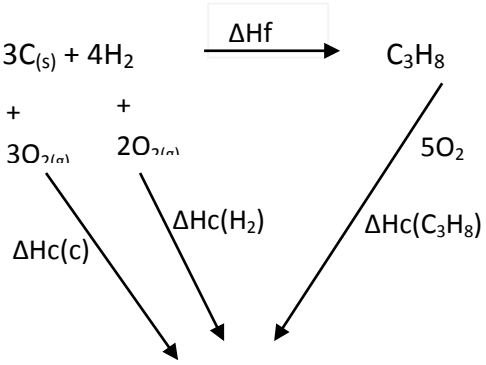
$\therefore RO_2 = RSO_2 \times 1.41$

$\frac{60cm^3}{50sec} = \frac{80^3}{T\ sec} \times 1.41$

Time = $\frac{80cm^3 \times 50sec \times 1.41}{60cm^3}$

$=94.28sec$

18.



$3CO_{2(g)} + 4H_2O_{(l)}$

$\Delta Hf + \Delta Hc(C_3H_8) = \Delta Hc(C) + \Delta Hc(H_2)$

$\Delta Hf = \Delta Hc(C) + \Delta Hc(H_2) - (\Delta)Hc(C_3H_8)$

$=3 \times -406KJ + 4 \times -286KJ - (-2209)KJ$

$= -1218KJ - 1144KJ + 2209KJ$

$= -2362KJ +$

$= -153KJmol^{-1}$

19. (a) A – 234

B – 91

(b) 25% (¼) of the original radioactive element remained. This fraction will be reached in 2 half-lives (i.e. $½^2$)

2 x 6000 years

= 12000 years

20. (a) thermo-softening are those plastics which soften when heated and harden when they cool. Hence they can be re-melted again and again without losing their properties while thermo-setting are plastics which cannot be re-melted once they are formed

(b) this is to ensure the white precipitate formed is of AgCl and not $AgCO_3$

21. There are 16 electrons used for bonding in ethanoic acid molecule.

This is because there are 8 bonds formed and each bond is formed as a resulting of sharing two electrons

22. (a) $Cu(OH)_{2(s)}$

(b) $[Cu(NH_3)_4]^{2+}{}_{(aq)}$

23. Q=IT

=0.82 X 5 X 60 X60

=14760 Coulombs deposited 2.65g of metal Z

K $\frac{14760\ x\ 52\ C}{26.5}$ deposited 52g of metal Z

=289630.189coulombs

No. Of faradays = $\frac{289630.189}{96500}$

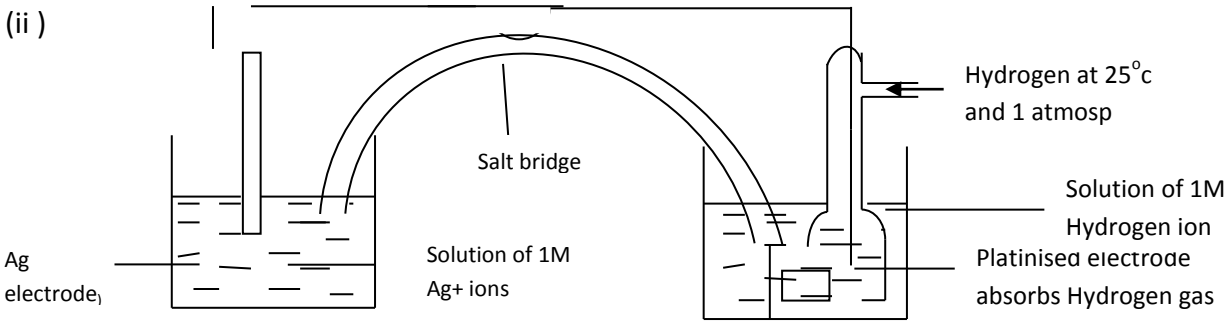
Hence the charge on the ions of metal Z is +3

24. (i) em.f = E_{red} - E_{oxid}

= 0.89v – 0.86v

= 0.03v

(ii)



25. (a) - It is a measure of how difficult it is to remove an electron from an atom in gaseous state
    - It is that energy that must be observed to remove the outermost electron from an atom
    - The amount of energy required to remove a mole of electrons from atoms when in gaseous state

    (b) Y. It has the lowest ionisation energy hence requires the least amount of energy to give out its electron

26. (a) the condition necessary to establish an equilibrium is both forward and backward reaction or reversibility of reactions

    (b) the equilibrium will shift to the right/forward reaction will take place.\

    This is because potassium hydroxide absorbs carbon(iv)oxide hence forward reaction occurs to replace the carbon(iv)oxide absorbed by KOH

27. (a) hydrogen gas, nickel or palladium catalyst and high temperatures of vegetable oils

    (b) vegetable oils, salt solution, potassium hydroxide or sodium hydroxide solution, source of heat.

28. (a) chemical

    (b) Physical

    (c) physical

29. (a) dip glass rod into the suspected solution with Ca^{2+} ions and heat it in a flame, if Ca^{2+} ions are present, brick red flame will be observed

    (b) mix the sample with $Ca(OH)_2$ and heat. Test the gas produced with red litmus paper, (moist). If NH_4^+ ions are present in the sample, NH_3 will be produced and will turn red litmus paper blue

30. - Mg^{2+}
    - Ca^{2+}

31.