KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

NAIROBI SCHOOL
CHEMISTRY
PAPER 2
MARKING SCHEME

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NAIROBI SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016
QUESTION PAPER 2
MARKING SCHEME

1. (i) A √ 1mk gain $2e^-$ and attain its stability √ 1mk

(ii) Giant ionic structure C_2O_2 is an ionic cpd. Has a very strong force of attraction (electrostatic force) between the ions.

(iii) E is more reactive than H – this is because group (vii) elements/Halogens react by gaining and ∴ the smaller the atom the more reactive it is.

(iv)

I $B_{(s)} + Cl_{2(g)} \longrightarrow BCl_{2(s)}$ √ 1mk

II No. of moles of Cl2 = 1.21 = 0.054 moles √1mk and since mole ratio of B to Cl2 is 1 : 1 hence no. of moles of B is 0.054.

∴ 0.054moles = 1.3g

$\frac{1 \times 1.3g}{0.054} = 24.07g$ √1mk

(v) (a) G has smaller atomic radius than F. √½mk this is because across the period, there is additional protons attracting the same no. of enough levels.

(b) The PH of B is above is 8.0 *** it is basic oxide while that of d is below 5.0

2. (a) (i) By passing A through a U – tube filled with CaO√1mk

(ii) dinitrogen tetraoxide √1mk

(iii) Brown solid seen √1mk

(iv) $2NH_{3(g)} + 3CUO_{(s)} \longrightarrow 3CU_{(s)} + 3H_2O_{(l)} + N_{2(g)}$ √1mk

(v) Excess NH3 react with water to form ammonium hydroxide solution which is basic. √1mk

(b) (i) Ammonium chloride sublimed and collected in the cooler parts of the round-bottomed flask and the delivery tube √1mk

(ii) • Ammonia salts liberates ammonia gas when heated with an alkali, not from its salt √1mk

• So that the water, as it condenses does not run back into the hot flask and cracks it. √1mk

(iii) Ammonia combines with hydrogen chloride Or Ammonia being basic reacts with acidic gas to form a salt $NH_{3(g)} + HCl_{(g)} \rightleftharpoons NH_4 Cl_{(s)}$ √1mk

(iv) Nitrogen and Hydrogen V ½mk

3. (a) (i) E+√½mk : higher electronegative √½mk

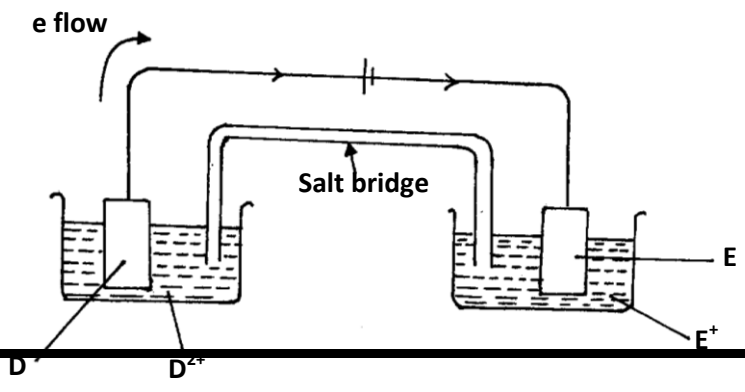
H2: higher electropositive √½mk

(ii) $C(s) \rightarrow C2 + 2e- - 0.34$

$g^{2+} 2e- \rightarrow D_{(s)}\ 0.44$

$C_{(s)}\ D^{2+} \rightarrow C^{2+} + D(s) = 0.1V$

(iii)



Labeling √ 1mk
Direction y e- √ ½ mk
Electrodes √ ½ mk
Electrolytes √ ½ mk
Salt bridge √ ½ mk

(b) (i) Electrode X √ ½mk; reduction rxn took place; producing gas B √ ½mk

(ii) $4OH^-(aq) \rightarrow 2H_2O(l) + O_2(g) + 4e^-$

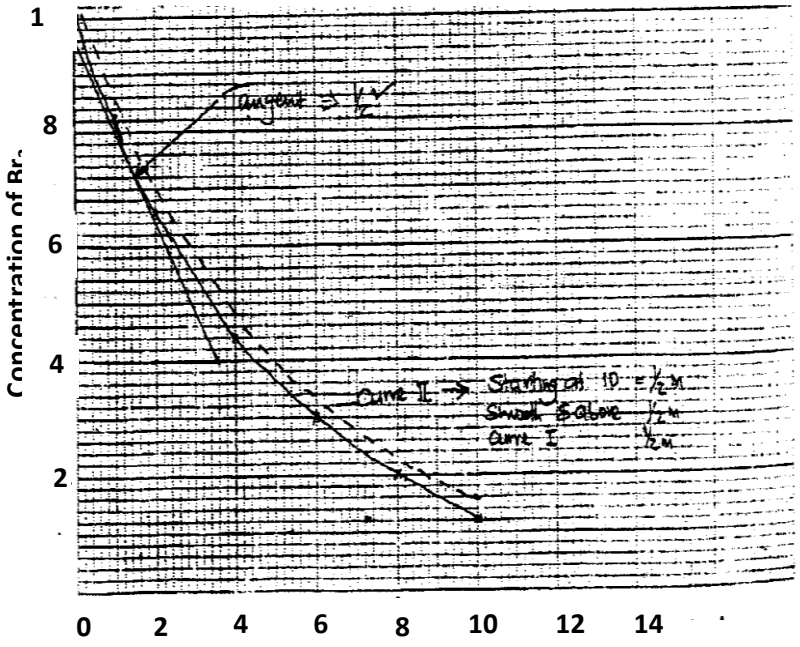
(iii) I- a = it = 0.03 x 99 x 60 = 178.2 √ ½mk

$M = \frac{RMM \times C}{e \times f} = \frac{92 \times 178.2}{e \times 96500}$ √ ½mk = 0.11

$e = \frac{92 \times 178.2}{0.11 \times 96500}$ √ ½mk

= 1.544 moles √ ½mk

4. (a)



(b)

(i) Conc of Br_2 after 3 minutes $5.3 \times 10^3 \times 10^3$ mol/dm^3 ± -0.1

(ii) Change in concentration
Change in time

$\frac{(9.6 - 5.0) \times 10^3}{3 - 0}$

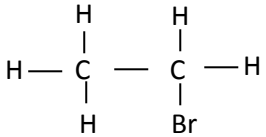
= 1.53×10^3 mol/dm^3

(c) At high concentration the rate of reaction is high because the particles the solution collide at a high frequency or more particles collide more often.

(d) At a lower temperature the particles have less kinetic energy hence frequency of collision is reduced or few particles have activation energy.

5. (a) (i) a– Ethanol b– Ethanoic acid c- Mmethane
d – Ethyl ethanoate

(ii) X – C_2H_5Br or



√ ½ mk

1 – bromoethane √ ½ mk

(iii) Step 2
Reagents – Acidified potassium permanganate/acidified chromate (vii)
√ ½ mk

Condition: Catalyst – temp 37 – 40^{o}C√ ½ mk / warm

(iv) $CH_3COOH (aq) + NaOH (aq) \rightarrow CH_3COONa(aq) + H_2O (l)$

(v) Polymerization

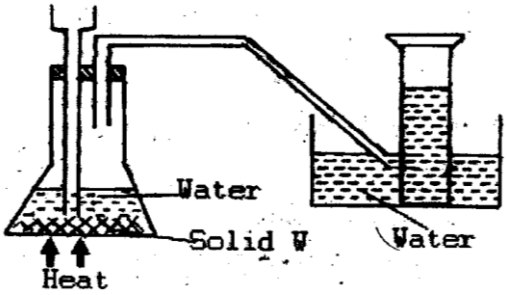
(b) (i) D- Concentrated sulphuric (vi) acid √1mk

L- Sodium hydroxide solution √1mk

(ii) Does not form scum √1mk

(iii) Non-biodegradable √1mk

6. (a) (i)



(ii) Sodium peroxide √ 1mk

(b) (i) $4P_{(s)} + 5O_2(g) \longrightarrow 2P_2O_{5(g)}$ √1mk

(ii) Phosphorus (V) oxide dissolves in water to form an acid (Phosphoric acid) √ 1mk

(c) A firm oxide (aluminium oxide) is formed on the surface of the metal. This oxide protect aluminium from further attack √ 1mk

(d) (i) A reaction which proceeds by production of heat i.e. heat is loss to the surroundings√1mk

(ii) The yield to be lowered: through by Le- Chateliers principle, the yield is expected to increase. But lower temperatures will result into fewer particles attaining activation energy. √1mk

(iii) RMM of SO_3 = 32 + 48 = 80

Moles of SO_3 used = 350 = 4.38 moles

Moles $H_2S_2O_7$ = 4.38 mol

RMM $H_2S_2O_7$ = 4.38 mol

RMM $H_2S_2O_7$ = 2 + 64 + 112 = 178

Mass = $H_2S_2O_7$ = 4.38 x 178 = 779.6 kg

7. (a) (i) Copper II oxide changes from black to brown √ ½mk

It is oxide oxide to copper metal which is brown √ ½mk

Clear liquid collects √ ½mk; oxygen so *** least at with Hydrogen to form water √ ½mk

(ii) $H_{2(g)} + CUO_{(s)} \longrightarrow CU_{(s)} H_2O_{(l)}$ √ ½mk

(iii) Water √ 1mk

(iv) Using anhydrous copper (II) sulphate which changes to blue in present of liquid X or using blue cobalt chloride paper which changes to pink √1mk

(b) (i) Magnesium is higher than hydrogen in the reactivity series hence cannot be displaced √ 1mk

(ii) $2H_2(g) + O_2(g) \longrightarrow 2H_2O(l)$

(c) (i) Large suspended particles e.g. leaves, stones, sand, gravel/grit

(ii) Sedimentation/precipitation √ 1mk

(iii) (a) Permanent hardness √ 1mk

(b) Addition of washing soda Na2CO_3 which precipitates $g^{2+}_{(aq)}$ as $gCO_{3\ (s)}$ √ 1mk