KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

MOI GIRLS – ELDORET HIGH SCHOOL

CHEMISTRY

PAPER 2

MARKING SCHEME

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MOI GIRLS – ELDORET KCSE TRIAL AND PRACTICE EXAM 2016

QUESTION PAPER 2

MARKING SCHEME

1. (i) Noble gases √1

(ii) D2SO4 √1

(iii) (a) Y √1

(b) E √1

(iv) Ionic bond √1 – Because B reacts by losing an electron (s) which are gained by H. √1

(v) D//M √1 Any one, one mark

(vi) Because E reacts by gaining an extra electron which reduces √1 the electrostatic pull by the positive nucleus making the ionic radius increase. wtte

(vii) At Period III Group IV

(viii) Because of the increase in the strength of the molecular bonds in the oxide of L as compared to that of G. √1 w.t.t.e

(ix) C has a smaller atomic √1 radius than I because of the increase in the strength of the nucleus on the valency electrons in C as the number of protons increase √1 w.t.t.e

(x) 1st ionization energies increases from J – L across the period due to addition of an extra proton in the nucleus increasing the attraction of the valency electrons √1

2. (a) (i) Nitrogen √ ½ and hydrogen √ ½

(ii) Platinum √1

(iii) $4NH_3(g) + 5O_2(g) \xrightarrow{\text{Platinum}} 4NO(g) + 6H_2O(g)$ √1

(iv) Neutralization √1

(v) The concentrated nitric acid oxidizes sulphur to sulphuric VI acid. The acid is reduced to nitrogen (IV) oxide √1

$S(s) + 6HNO_3(l) \longrightarrow H_2SO_4(aq) + 6NO_2(g) + 2H_2O(l)$ √1

(vi) Any metal above copper but below sodium in the reactivity series. √1

(vii) (i) J – NH_4NO_3 √1

(ii) Molar mass $NH_4NO_3 = 28 + 4 + 48 = 80g$ √ ½

Therefore 80g of NH_4NO_3 contain 28g of nitrogen

14g of nitrogen would be contained in 14/28 x 80 √

= 40g of NH_4NO_3 √ ½

(b) $(NH_4)_3PO_4$ is less soluble √ hence it is less easily leached from the soil √

- $(NH_4)_3PO_4$ provides the plant with nitrogen and phosphorous √1.

3. (a) (i) But-1-yne √1

(ii) But-2-ene √1

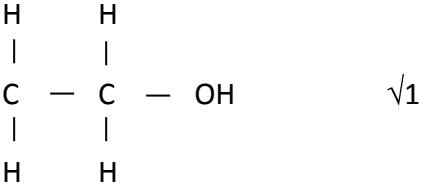
(b) (i) Q – Ethylpropanoate √ ½

R – Ethanol √ ½

W – Carbon (IV) oxide √ ½ each ½ mark

K – Hydrogen gas √ ½

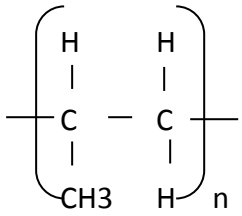
(ii)



√1

As a fuel √1

(iii) $2CH_3CH_2COOH(aq) + Na_2CO_3(aq) \longrightarrow CH_3CH_2COONa(aq) + H_2O(l) + CO_2(g)$ √1

(iv) 

Poly propene √1

(v) Esters √1

4. (a) M – Oxygen √ ½
N – Hydrogen √ ½

(b) $4OH^-(aq) \longrightarrow 2H_2O(l) + O_2(g) + 4e$ √1

(c) Cathode, √1 since H+ which has an oxidation number of +1 is reduced to H2 which has an oxidation number of O. √1

(d) Platinum √1 / graphite since they are inert and therefore do not react with the electrolyte or the products √1

(e) (i) Ba, Zn, Ag √1
Decreasing reactivity

(ii) E.M.F = Eθ reduced – Eθ oxidized
= -0.76 - -2.90 √1
= + 2.14V √1

(iii) The chlorine gas formed √1 would react with zinc anode. √1

5. (a) Carbon (IV) oxide formed is escaping √1

(b) $CaCO_3(s) + 2HCl(aq) \longrightarrow CaCl_2(aq) + H_2O(l) + CO_2(g)$ √1

(c) - Increasing the temperature √1
- Increasing the concentration of hydrochloric acid √1
- Using powdered calcium carbonate instead of marble chips

Any two, 2 marks

(d) All the marble chips have been used up √1 // the reaction has come to an end.

(e) White precipitate formed √1 which dissolves in ammonia solution √1

(f) - Causes global warming √1
- Causes acid rain.

(g) - In fire extinguishers √1
- In aerated drinks √1
- Making artificial rain

Any two, 2 marks

6. (a) Enthalpy change when 1 mole of water is formed from the reaction between hydrogen and hydrogen ions √1 (a base and an acid)

(b) $H^+(aq) + OH^-(aq) \longrightarrow H_2O(l)$ √1

(c) (i) $\left(\frac{25.0 + 25.0}{2}\right) = \left(\frac{50}{2}\right)^0C = 250C$ √ ½

$\Delta T = (34 – 25)^0C$
= 9.00C √ ½

(ii) $\Delta H = Mc \Delta T$
Total volume = (100 + 50)cm3
= 150cm3
Mass = 150cm3 x 1gcm-3

= 150g

$\Delta H = \frac{150\ kg}{1000} \times 4.2\ kJkg^{-1}k^{-1} \times 9k$ √

= 5.67 kJ √

(iii) The molar heat of neutralization of sodium hydroxide

If 1000cm3 = 2M
50cm3 = ?

$= \frac{50}{1000} \times \frac{2}{1} = \frac{1}{10} = 0.1$ moles

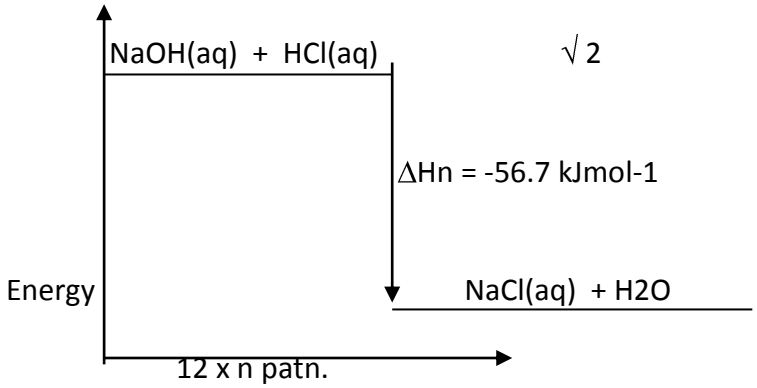
If 5.67kj is liberated when 0.1 moles are neutralized then to neutralize 1 mole we have

$\frac{1}{0.1} \times 5.67kJ$ √

= 5.67 kJ mol √

(d) $H^+(aq) + OH^-(aq) \longrightarrow H_2O(l)$ √ ΔH neut = -56.7 kJmol-1

(e)



√ 2

7. (a) (i) Molten aluminium oxide √1 (reject formula)

(ii) Aluminium metal √1

(iii) Anode √1

(b) Carbon √1

(c) (i) $Al^{3+} + 3e^- \longrightarrow Al(s)$ √1

(ii) Oxygen gas evolved at E √1 reacts with the carbon electrode to form $CO_2(g)$. Hence it is consumed.

(iii) To lower the melting point √1 of Al_2O_3 so as to conserve energy

(d) Bauxite √1

(e) $Al^{3+} + 3e \longrightarrow Al$ √1 Q = It √ ½

27g 1 mole $\longrightarrow$ 3F = 3 x 96500 √ ½ = 25 x 36 x 60 x 60

$\frac{27 \times 25 \times 36 \times 60 \times 60}{3 \times 96500 \times 1000}$

= 0.3022kg √

(f) - Making cooking pans √
- Making electric cables √
- When alloyed its used in making body pans √ of air crafts (buralumium)
- Making packaging foils e.g cigarette packs √ etc

Any 2 x 1 = 2