**NYATIKE SUB-COUNTY JOINT EVALUATION EXAMS**

**CHEMISTRY 2**

**JULY/AUGUST 2014**

**MARKING SCHEME**

1. (a) C and I √1

 (b)(i) E √1

 (ii) D √1

(c) E√1- its outermost energy electrons are strongly held by thr nucleolus because nucleus charge increases across the period

(d) G and D, K and I, D and E, J and E, J and G*(Any correct pair leads to formation of ionic structure)*

(e) H and C I and C √1*( Pair that leads to formation acidic gas)*

(f) B-2.5 B3+J2 B2J3

 J-2.8.2



**-3**

**J12p+**

**J12p+**

**B7p+**

**J12p+**

**B7p+**

**2+**

**3-**

(g) K-2.8.2

D-2.8.8.1

The number of e-s used √1 in metallic bonding in K are more than the one used in D metallic bonding√1

2. (i)

 (ii) 945±5cm3 (*evidence of extrapolation emphasized)*

(iii) Rate = 

 *Evidence of extrapolation emphasized*

 *Evidence of tangent at the 25th second for the curve emphasized*

 *Units MUST be indicated*

 (iv) CaCO3(s) +2HCl(aq)  CaCl2(aq) + CO2(g) + H2O(l)

 Volume at 100th sec 1120cm3

 1 mole of carbonate = 1 mole of CO2(g)

 100g = 22400cm3

 ? 1120cm2

 = 100x1120 = 5g

 22400

 (II) Yellow colourisation intensify//solution become more yellow√1

 The equilibrium shifts to the left/backward reaction is favoured√1

3. (a)(i) Mass of gas= 90.121-90.050

 =0.071g√ 1

 0.071 = 22.2

RAM X 22400√ ½

RAMX= 0.071x22400

 22.2

 (ii) C3H8+5 O2 3CO2(g) + 4H2O(g)

(iii) For a fixed of a gas the volume is directly proportional to the absolute temperature provided pressure remains constant√1

(iv) V1 = 4dm3 T1=227o C(500k) P1=152mmHg

V2=2dm3 T2=-23oC (250k)P2 ? *(conversion to Kelvin scale √1)*

P1V1= P2V2 =4 x 1Ω= 2 x P2

T1 T2 500 250

=P2=4x152x250

 500x2√ ½

 P2=152mmHg√ ½

 © (i) Solution Q –Aluminum sulphate Al2(SO4)3

 Solid R-Barium chloride (BaCl2(s)/BaSO4

4. I(a) Carbon is a stronger reducing agent than hydrogen (1mk)

 (b) CO2√1 or Carbon (iv) Oxide gas

 (c)(i) 2Fe2O3 + 3C(s)  4Fe(s) + 3CO2(s) √1

 2 moles of Fe2O3 4 moles of Fe√1

 Moles of oxide moles of metal

 1.5 0.009398 x4 moles of metal

159.6 2

=0.009398nole 0.018797 moles of metal

1 mole Fe=55.8g√ ½

∴0.018797=55.8x0.18797=1.049√1g

(II) (i) Resins (Per…) contains Na+ which are exchanged for Ca2+ and Mg2+ in the hard water

OR Ca(HCO3)2 (aq) CaO+ Na2X(s) CaX(s) +2NaHCO3(aq)

CaSO4(aq) + Na2X(s) CaX(s) + Na2SO4(aq)

(ii) By washing the resin with brine solution of sodium chloride

(iii) Provides Calcium for the body fro growth of teeth and bones// improves taste of water //Good for brewing of beer// Prevents lead poisoning (form insoluble lead sulphate and carbonate in Lead pipes prevents Lead from getting into water. √1

(iv) (a) Effervescence occurs/blue solution is formed

5. (i) Haematite // FeO3√1/magnetite/siderite

 (ii) Coke (a) Produce Carbon (II) Oxide upon burning the main reducing agent

 (b) Carbon (II) Oxide is the reducing agent√1

 (iii) Zone P. (upper zone)

 (1) 2C(s) + O2(g)  2CO(g)

 (2) Fe2O3(s) + 3CO(s) 2Fe(s) + 3CO2(s)

(iv) 900oC-1200oC√1

(v) Calcium silicate and Calcium Aluminium Oxide(both √1)

(vi) Grey- white luster, has magnetic property up to 776oC

Density of 7.86gcm-3, mpt of 1530o, Bptof 3000oC, malleable, high tensile strength, conductor of heat and electricity *(any correct two one mark each*

(II)(a) XCO3+2HCl XCl2(aq) + CO2(g) + H2O

(b)(i) NaOH(aq) + HCl(aq) NaCl(aq) + H2O(l)

Moles of acid= 25 x 0.1=0.0025moles

 1000

 Moles of acid: moles of base =1:1

 ∴moles of acids =0.0025moles√ ½

 If 20cm3 of HCl= 0.0025mole

 ∴250cm3= 0.0025x250

 20

 = 0.03125moles in 250cm3

(ii) Moles in 50cm3= 50 x 1 = 0.05moles

 1000

 The moles that reacted with XCO3

 = 0.05-0.03125√1

 =0.01875 moles

 (iii) Moles of XCO3 that reacted =

 Mole ratio of carbonate: acid =1:2

 ∴Moles of XCO3= 0.01875= 0.009375 √1mol

 2

 0.009375 = 1.5

 RMM√ ½

 RMM= 1.5 √ ½ = 160√ ½

 0.009375

6. (i(a) Level of water rises in the test tube, to occupy the space left by the part of air used for rusting of iron

 (2) Iron wool from grey turns to redish-brown, its oxidized to Iron (III) oxide // rusted √1

 (ii) 4 Fe(s) +3O2(s) + 3H2O 2Fe2O3H2O(s)

(II)



**Each spot √ ½ mk total 1 ½**

**Solvent form 1mk**

**2**

**Solvent front**

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 (III) (b)(i) Hydrogen or Ethyne/√1 /acetylene

(iii) Sulphur exist as S8…of molecules which is bulky hence stronger Van Der Waals√ ½ forces of attraction while Oxygen exist as a discrete √ ½ diatomic molecule (O2) hence weakens van der waals forces within the simple molecular structure.

(iv) Add water √ ½ to the mixture Sodium Sulphate dissolves filter to obtain lead (I) sulphate as a residue and filtrate to saturation allow to cool for crystals √ ½ to form then dry it between two filter papers

7. (i) Q ½ its boiling point is less than 25oC/boils at -47.7oC

 (ii)

|  |  |
| --- | --- |
| S | T |
| S put in acidified Potassium Manganate (VII) the solution remains purple√1 | Decolorizes acidifies KMnO4 solution  |

H

H

H

H

H

H

O

H

H

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(iii) R - H - C - C - C - OH propanol

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* H - C - C - O - H ethanoic acid

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K- Propane and ethanoate√1

Group of crystals-Esthers√1

(iv) B- Cathode √1

A-Anode√1

(v) Distilled water is not ionized// doesn’t have free and mobile ions, therefore no electric current was conducted√ ½

(c) (i) The bulb lights // gas bubbles seen in the test tubes

The resulting solution will have free and mobile ions, which conducts electricity

(ii) Anode 4 OH- 2H2O(l) + O2(g) + 4e-

Cathode 4H++4e- 2H2(g)

(iii) 4OH-(aq)+ 4H+ 2H2O(l) + O2(g) +2H2O(g)