ASUMBI GIRLS HIGH SCHOOL

 PRE-MOCK

MAY-JUNE

2022

**233/2 CHEMISTRY**

**MARKING SCHEME**

**FORM 4**

**1 a)**

1. V
2. S
3. Q Neither gain nor lose electrons’ hence only give more room for bond formation
4. Alkali metals
5. On the grid
6. It ionizes by receiving an electron , hence the gained electrons repelled by the already existing electrons

 b)i) SICl4, PCl5, SCl2,

 Melting below room temperature and boiling point above room temperature

 ii) AlCl3 has simple molecular structure with weak van der waal forces , while MgCl2 has giant ionic

structure with strong ionic bond

2. (a) M- Vanadium (V) oxide√

 N- Concentrated sulphuric (VI) acid

 (b) To dry the gases SO2 and air√1

 (c)Forward reaction is exorthermic

* 197KJ energy is produced when 2 moles of SO3 are formed
* 98.5 KJ are produced when 1 mole of SO3 in addition to keeping the boiling tube dry

(d) Deposition/solidification

(e) CaO reads with the escaping SO3 in addition to keeping the boiling tube dry.

(II) (a)(i) –Sulphur (IV) oxide gas √ ½

* - Oxygen gas (air) √ ½

 (ii) reduces environmental pollution √ ½

Reduces costs √ ½

(b) (i) –Is the removal of acidic gases by reacting it with a base e.g SO2 reacted with Ca(OH)2

 (ii) SO2(g) + Ca(OH)2(s) CaSO3(s) + H2O(l)

(c) SO3 reacts with water producing a lot of heat which causes acid mists or sprays which are corrosive √1

(III) C1V1=C2V2

 1.82 x V1= 2x1000√1

 V1= √1

 = 109.8901cm3√1

3 a) (i) D+ 4

( iii) A (s)



**1MA2+**

**1MB2+**

**B (s)**

**Salt bridge**

b i)

**A (s)**

ii) emf + E red - E ox

* .44 ---0.776 = 0.32v

iii) D4+ /D3 and As /A2+

fe3+( ag ) + 3 e fe(s)

1 mole 3mole 1 mole

* o.1 mole of fe 3+ + 0.1 \* 3= 0.3 feraday

d i) to prevent steel from rusting

1. to prevent steel from reacting with chromium at higher temperature since copper or nickel are uncreative
2. Fe24 (ag) + CV (S) - Cv2+ (ag) + F4 (s)

IV) Q = It = 4.5 x 20 x60 x 60 = 324 ,000c

 Mass deposited = 52 x 3240000/ 96500/2 = 87.295 g

4a) propane

 H HH

 H - | | | - H

C - C- C

 | | |

 H HH

b) Reagent – concentrated sulphuric (vi) acid

Condition: 160 - 1800 c

ii) condition:uv light /sunlight

c) (i) carbon(iv) oxide

 (ii). hydrogen

 (iii) propane-I-oic acid

1. Bromo-propan – 2-01

 2 bromopropane -1 -01

 d) 2 C3H7 ,OH(I) + 902 (g) - 6Co 2 (g) + 8 H2O (g)

e) Addition polymerization /polymerization

f) 3x12x 1x 6 = 42

N = 2100/ 42 = 500

5a) phosphonessmolders

Itsreaction with air is exothermic

II) phosphorous (iii)oxide formed is an acidic oxide which dissolves in water to form phosphoric oxide.

phosphoric(iii) acid

iii) volume of air used = 30.65 – 24. 28 = 637 cm

percentage volume = 6.37/30.65 \* 100 = 20.78%

b)black powder changes to red brown bead

brownbeed Mg reduces Cv0 to copper metal

 White ash formed : Mg is oxidized to Mg0

C) carbon 9ii0 oxide

Sulphuric (iv) oxide

Nitrogen (iv) oxide

6) mass of magnesium = 20.36 – 19.52= 0.849

 Mass of oxygen = 20.92= 20.36=0.56g

 Mass of Mg0 = 20.92 – 19.52 = 1.40g

% of magnesium = 0.84/ 1.40\* 100 =60%

% of mass of oxygen Mg0= 0.56/1.40\*100= 40%

II)elements present Mg 0

 Mass 0.84 0.56

molespresent 0.84/24 0.56/16

 0.035 0.035

Simple ratio

 Formula Mg0

b) 2 Na0H (ag) + H2 So4 - Na2S04 (ag) = 2 H20

ii) I : moles ratio of Na0H ;H2SO4 = 2:1

 Moles of Na0H = 2 x 0.005 = 0.01

ii) if 50 cm3of Na0H = 0.01

 1000 cm3  of Na0H = 1000 x 0.01/50 8 0.02moles

 OR Ans in (i) x 1000 /50 = Ans

iii) molar mass of Na0H = 23 +1 =16 = 40 G

 Mass of Na0h reacted = 40 x 0.2 = 8g

 Mass of NaCL = 0.8/8.8 x 100 = 9.0909%

7a) H HHH

 | | | |

 H- C - C- H + Bv - Bv H- C- C - Bv + H -Bv

 | |

 H H | |

 H H

 Bond breaking energy = 413 +193 = 606kj

 Bond function energy = 280 +365 = 645 kj

H for the reaction = 606- 645

 = 39 kj

Temp 80

b )

**-10oC**

**Time**

c) C s = 5 H2 g Δ H2 c4 H10 (g)

4CO2 g + 5/2H2O13/2 O(g)

4CO2 g + 5H2O∆  H3

∆H2 = ∆ H1 -∆H3

= ( 4 x -343 +-286)-(-2877)

= -1572 – 1430 +2877

= -125 kHz /mol

d) ∆H +∆Hhyd

= 690 + 322 + 364

= 690- 686

= + 4 kJ / mol