**SUNRISE ONE TERM 1 EXAMINATION -2023**

***Kenya certificate of Secondary Education***

***FORM 4***

**233/2**

**CHEMISTRY**

**PAPER 2**

**MARKING SCHEME**

1. a)I) A and E / C and I √1 Any for 1mk

II) D and E √1

b) i) 

 ii) In gaseous form the compound lack mobile ions while in aqueous state it is in ionic form hence conduct

 electric current √1

c) Melting point of oxide of H is higher than that of oxide of I;H oxide have Giant covalent structure with strong covalent bond √1 while oxide of I have simple molecular structure with weak intermolecular bond √1 2mks

d) 

 OR  √1

1. a)i) Tetraammine copper (ii) ions √1

ii) Tetraammine zinc (II) ions √1

iii) Iron (III) hydroxide. √1

b) i) 34g of KCl 100g of H2O √ ½

 8.5g of KCl  of H2O √ ½ 1

 ii) Mass = (34 – 27) √ ½

 = 7g of KCl √ ½

c) When two solids are separately heated √ ½ and the gas passed over lime water, √ ½ white precipitate is formed √ ½ with sodium hydrogen carbonate while sodium carbonate does not produce a gas which turns lime water √ ½ into a white precipitate.

d) Effevescences are seen in test tube with √ ½ water and no effervescence are seen in test tube √ ½ with methylbenzene. Water can react with magnesium to form hydrogen gas due to hydrogen ions √ ½ in water while methylbenzene is non – polar √ ½ hence lack ions.

e)i) B; √ ½ requires less volume √ ½ of soap to form lather and the volume of soap used does not change even after boiling.

ii) Sample C contains temporary hardness √ ½ which is removed through boiling √ ½ hence reduction in volume of soap.

1. a)i)  √1

ii) 0.0006 moles √ ½ 1

iii) √ ½ = 0.0003moles√ ½ 1

b) I) i) Hydrogen sulphide √1

 ii) Sulphur (IV) oxide √1

 II) Pressure of 2-3 atmosheres √ ½

 Temperature of 4500c

III) Sulphur obtained from sulphur (IV) oxide is added to carbon (IV) sulphide in a boiling tube. The contents is then stirred and filtered √ ½ into a dry beaker. The filtrate is allowed to evaporate √ ½ to form Rhombic sulphur. 2

IV) When sulphur (IV) oxide is dissolved in water; excessive heat is generated that boil the acid to produce fine droplets that can cause burn. √1 1

 V)

 VI)- Large scale manufacture of sulphuric (VI) acid √ 1

* Vulcanisation
* manufacture of bleaching agents
* Used as a fungicide.
* Manufacture of fireworks and dyes

Any two

1. H H H H H H H

 | | | | | | |

C = C – C – C – H + H – H H – C – C – C – C – H

| | | | | | | |

H H H H H H H H

1. (C=C) + 2( C-C ) + 8 ( C – H ) + H – H 3( C – C ) + 10 ( C – H )

 612 + 2 x 347 + 8 x 413 3 x 347 + 10 x 413

 612 + 694 +3304+ 436 1041 + 4130

 5046 √1 5171 √1

 ∆H = -125KJmol- √1 3

b) i)  √1

 ii) If 60g of C3H7OH 1560KJ

 10g of C3H7OH  √1

 = 260KJ √1

1. i) The energy changes in converting reactants to products is the same regardless of the route by which the chemical change occurs. √1

 ii) I)Standard enthalpy changes. √1

 II) √1

 

∆HӨC(H2)

5O2

∆HӨC(C3H8)

∆HӨC(l)

5O2

 3CO2 + 4H2O √1

 

 = ( 3 x – 393 + 4 x – 287) – ( - 2209) √1

 =( - 1179 + - 1148) + 2209

 = - 2327 + 2209

 = - 118Kjmol-1 √1

1. a)i) NH4Cl/ Ammonium chloride √1

ii) PbCO3 (g) / Lead carbonate √1

iii) Pb(NO3)2 (aq) / Lead nitrate √1

b) Heat √1

c) Orange solid that cools to form a yellow solid √1

d) i)  √1

 ii)

e) Name : Plumbate ion. √1

 Formula : (Pb(OH)4)2- √1

f) Mixture K is made of both soluble and insoluble salts hence need to separate them. √1

1. a)
2. CO2 is collected by downward delivery🗸1mk
3. Exchange apparatus containing water and concentrated sulphuric (IV) acid.🗸1
4. Use dilute hydrochloric acid for dilute sulphuric acid🗸1

b)

* It does not support combustion🗸1
* It is denser than air🗸1

c)

* M-Ammonia gas🗸1/2
* Q-carbon (iv) oxide🗸1/2

ii)

* F-Ammonium chloride🗸1/2
* X-Sodium hydrogen carbonate🗸1/2

iii)

* L-Calcium chloride🗸1
* Used as a drying agent🗸1

 iv) Tower P-NH3(aq)+CO2(g)+NaCl(aq)+H2O(l) NaHCO3(s)+NH4Cl(aq) 🗸1

 Chamber K 2NH4Cl(aq)  + Ca(OH)2(aq)  CaCl2(aq) + 2NH3(g) + H2O(l) 🗸1

v) Sodium chloride🗸1, Ammonia, coke or limestone. 🗸1

1. i) Due to production of CO2 which escape to the atmosphere 1

 ii) CaCO3(s) + 2HCl(aq)  CaCl2(aq) + H2O(l) + CO2(g) 1

 iii) Grind marble chips to powder form 1

 Increase concentration of HCl 1

 Increase the temperature of the reactants any 2 correct = 2mks

 iv) The reaction is complete since calcium carbonate has been used up 1

 v) White precipitate ½ insoluble ½ in excess ammonia solution

 vi)- global warming

 - cause acid rain any one = 1mk



 vii)

viii) i) Favours forward reaction1orange colour intensify 🗸1concentration of hydrogen ions increases🗸1

ii) Favour backward reaction yellow colour formed🗸1the reaction produces heat/ exothermic🗸1