ASUMBI GIRLS HIGH SCHOOL

PRE-MOCK

MAY-JUNE

2022

**CHEMISTRY 233/1**

**MARKING SCHEME**

1. **Into a given amount of dilute nitric (V) acid in a beaker add excess Zinc powder and stir√ (½mk) (until no more can dissolve). Filter the mixture to obtain unreacted zinc powder as the residue and zinc nitrate solution as the filtrate. √ (½mk) Into a beaker containing water add solid sodium carbonate and using a stirring rod stir until all of it dissolves. √ (½mk) Into the beaker containing zinc nitrate solution add the sodium carbonate solution. Zinc carbonate will be precipitated out. √ (½mk) Filter the mixture to obtain zinc carbonate as the residue. √ (½mk) Rinse the residue using distilled water to remove impurities the dry it in between two dry filter papers. √ (½mk)**
2. **Hold a match stick on a pin and let the head rest on the chimney when the chimney is lit the head of the match stick in the zone C does not light.**

**Or**

**Place a wooden splint or a card board across the region momentally it is noted that the region was not charred while the outer region was charred**

1. **P1V1 = P2V2; P1 = 750 V1 = 250, T1 = 27 + 273 = 300k**

**T1 T2**

**P2 = 750, T2 = 41 + 273 = 311k**

**V2 = P1V1T2 = 750 x 250 x 311 √ (1mk) = 311x 5**

**T1 x P2 300 x 750 6**

**= 259.167cm3√ (1mk)**

1. Molarity of NaOH = 4/40 = 0.1M **√ (½mk)**

Moles in 22.2 cm3 = 22.2 X 0.1

1000

= 0.00222 **√ (½mk)**

mole ratio OH- : H+ **√ (½mk)**

2 : 1

moles of acid = 0.00222

2

= 0.00111 **√ (½mk)**

mass = 1 x 0.1 **√ (½mk)**

0.00111

= 90 **√ (½mk)**

5. a) **H2S(g) + 2FeCl3(aq) 2FeCl2(aq) + S(s) + 2H+(aq)**

**b) -Pass excess gas, H2S through ecess concentrated sulphuric acid √ (½mk) to**

**absorb H2S gas. Through an alkali**

**o*r*  3H2S(s) + H2SO4(l) 4S(s) + 4H2O(l)**

* **Hydrogen sulphide gas is poisonous √ (½mk)**

**c) - Pass H2S through Lead (II) nitrate solution √ (½mk) a black precipitate of lead**

**(II) sulphide is formed √ (½mk)**

**6.They destroy the ozone layer in the atmosphere. √ (1mk) Ozone layer absorb harmful ultra violet light rays from the sun√ (½mk)**  **and once destroyed the harmful sun rays reach the earth which may cause cancer, eye problems and √ (½mk)**

1. **a)****(**half litres)

3.5 x 26

y = 224grams

**b)** Study the rate of absorption of fertilizer by plants using radioactive phosphorous

- tracing chemical and physiological processes such as photosynthesis by use of radioactive carbon 14

1. Oxide of sodium has higher M.P than the oxide of sulphur because oxide of sodium has a giant ionic structure where a lot of energy is required breakionic bond while oxide of sulphur has simple molecular structure where little energy is required to break van der waals forces.
2. a) A solvent whose molecules behaves as if its negatively charged on one end and positively charged in the opposite end. Solvent whose molecules are partially charged

b)When dissolved in water dissociate **√ ½**  into hydrogen and chloride ions hence an electrolyte while in methylbenzene it dissolve in molecular state**√ ½**

1. a) It is the change of the substance from its gaseous state into solid state without going through the liquid state.

b)Add dilute hydrochloric acid / sulphuric (VI) acid to the mixture. Zinc reacts to a soluble salt of zinc, while copper doesn’t react. Filter the mixture to obtain the copper powder as the residue

1. a) Haematite

b)Carbon(II) oxide

Carbon (core…)

1. a)Ca(HCO3)2(aq) CaCO3(s) + CO2(g) + H2O(l)

Mg(HCO3)2(aq) MgCO3(s) + CO2(g) + H2O(l)

b)Use of distillation method

- Use of ion exchanger

-Addition of sodium carbonate solution

c)- Stains white clothes

-Reposition of fur(calcium carbonate) in kettles,pipes and boilers hence reducing their efficiency

1. a)Diamond and Graphite

b)A white precipitate that dissolves to form a colourless solution

Ca(OH)2(aq) +CO2(g)  Ca CO2(s) + H2O(l)

CaCO3(s) + (H2O)2 + CO2(g) Ca (HCO3(aq))2

1. Na2 CO3 xH2O

% mass 36.8 63.2

Molar mass 106 18

No of moles  

1. 10.1

x = 10

1. a)The orange lead(II) oxide turned grey

-Colourless droplets on the cooler parts

b)3PbO(s)  + 2NH3(g) 3Pb(s) + N2(g) + 3H2O(l)

c)Used as a raw material in industrial manufacture of nitric(V) acid manufacture of nitrogenous fertilizer

1. a)Alkaline earth metals

b)The atomic radius is bigger than the ionic radius. The resulting positively charged ion experience greater nuclear attraction

1. a)They are saturated hence non-sooty

b)i)

ii)

1. a) Mass of solute that will saturate 100g of water at a certain temperature

b)i) 38 x 2 = 76g

ii)80-79 = 1g

1. a)Copper(II) carbonate

b)Effervescence would start and stop. This is because lead(II) chloride which is insoluble would form that coats lead(II) carbonate

1. a)Group(VIII) react by gaining electrons thus as the atoms become bigger down the group they have less attraction for electron.

b)Moist blue litmus paper turns red and then its bleached. Dry blue litmus paper remained blue.

1. a)Zinc and dilute hydrochloric acid/dil sulphuric(vi) acid

b)i) unreacted hydrogen

ii) The solid changed colour from white to blue. This is because when hydrogen reduces copper(II) oxide its oxidized to steam which condenses on the cooler part of the combustion tube and turns the compound blue.

1. a)Colourless, characteristic irritating choking smell, denser than air, soluble in water

b)Sulphur(IV) oxide reduces dichromate(VI) ions to chromium

c)The exhaust gases are passed through a chimney lined with calcium hydroxide which reacts with SO2 scrubbing.

1. a)i)Ammonium nitrate

ii)warm water

b)To prevent water that form on the cooler part of flask from flowing to the hot part of the flask.To prevent cracking of the flask by water which forms on the cooler part.

1. a)Has string metallic bonds with giant metallic structure hence high meeting point

b)Has giant covalent structure where atoms are covalently bonded hence no delocalized eletron.

c)Both ethanol and water are polar hence ethanol forms hydrogen bonds with water.

1. ..

ii)Purple vapour, due to formation of iodine gas

2I-(l)12(g) + 2e- Accept equation

1. 2CO(g) + O2(g) 2CO2(g)

100cm3  50cm3  100cm3

i)CO2 gas 100cm3

ii)Oxygen gas 100 – 50 = 50cm3

1. a)

b)i)

ii)

1. a)

i)Carbon(IV) oxide

ii)Filtration

iii)Calcium oxide

iv)Ammonia

b)NH4Cl(aq) + Ca(OH)2(s) CaCl2(s) + H2O(l) + NH3(g)