**Kenya Certificate of Secondary Education 2019**

**Marking scheme**

**CHEM PP2**

Turn over

1. .a. i) Alkali metals (½mark)

ii) Noble gases (½ mark)

1. H - Metals (½mark)

M - Non metals (½ mark)

1. A - Air balloons ( 1mk)

N - Prevention of oxidationoffilament. (1mk)

1. G has a bigger atomic radius than H (1mk). There is an increase in nuclearcharge
2. R forms an ion by gaining anelectron.

The negative charge is bigger (1mk) than the positive.

1. I2X3 (1mk)
2. E (1mk). It has the biggest E~~0~~value / Hashigh tendency to gainelectrons.

h) i) P - 2 .8.8.2 (½ mark)

ii) Ion of E ==> 2.8 (½ mark)

1. H or P (½mark)
2. The second ionization energy of H is bigger than the 1st (1mk). 2nd ionisation energy involvesthe removal of an electron from chargedparticle.
3. Nitrogen gas can be obtained from air as shownbelow.

a) i) To remove carbon (IV) oxide1mk

ii) To react with oxygen 1mk

1. The drive out air1mk
2. Concentrated sodium hydroxide1mk
3. Argon
4. i) Filter to remove dust particles through electrostaticprecipitation.

Chamber X - To remove moisture / dry the gas

1. Fractional distillation1mk
2. M - Oxygen (½ mark) N - Argon (½mark)
3. Manufacture of ammonia (1mk)

- As a refrigerant for semen (1mk

In light bulbs to prevent oxidation of thefilament

1. 3.0.6g of Manganese (IV) oxide was placed in a flask and 25cm3 of hydrogen peroxide added. The volume of oxygen gas produced was recorded after every 10 seconds. The results obtained were recorded in the tablebelow.
   1. Plot a graph of volume (cm3) againsttime(sec). (3mks)

a) Scale (½mark)

Labelled (½ mark) Plotting 1mk

Shape 1mk (smoothcurve)

* 1. 55cm3 (MUST be shown on the graph) 1mk (Otherwise penalisefully)
  2. Curve more steep and above the previouscurve NB - Flatten at the same point 1mk

MnO2

d) 2H2O2(l)→O2(g) + 2H2O(l) 1mk

1. Relights a glowing splint1mk
2. In hospitals to patients with breathingproblems 1mk
   * Oxyacetylene flames in welding1mk

Mountain climbers and deep seadiver

1. a) Directsynthesis
   * Precipitation
2. Put 20cm3 of 1M sodium hydroxide in abeaker
   * Add 1M HCl acid (20cm3)
   * Evaporate the solution toconcentration.
   * Cool the solution to formcrystals

-Dry the crystals between filter papers.

#### CaCO3(s) → CaO(s) +CO2(g

#### Strongbase Weakbase

-pH12-14 pH 8 -11

Ionisefully Ionisepartially

* + Good Poor conductor conduction ofelectricity

1. i) Magnesium and calcium ions present cannotbe decomposed byboiling.

ii) Boilers scale Stain clothes

* + Blockage of lead pipes (notwater)

Lead (II) oxide

1. A mixture canbe separated by physical means (eg filtration, distillation etc) a compoundcannot.
   * The components of air are not in definite whole number ratio in a compound, the elements are combined in definite whole number ratios,
   * A compound is a pure substance whilst air is a mixture of severalsubstances. (any (2 x 1) =2mks
2. i) A : It separates the dye to the greatest number of components ie separates the dye themost.

ii) The dye is insoluble in the solvent C

1. i) Baseline /Origin
2. The solventfront
3. Yellow - It moves the shortest distance from theorigin.
4. i) Fractionaldistillation
5. The gases are used as afuel
6. Gases, Petrol, Lubricating oil, Bitumen
7. a) To imporve its conductingproperties
8. Graphite orPlatinum
9. Gas A - Hydrogen gas Gas B - Oxygengas
10. Anode - Electrode on the right (Labelling should be on thediagram)

Cathode: Electrode on the left (Labelling should be on the diagram) e)

Gas B = Oxygen

4OH-(aq)→ 2H2O(l) + O2(g) + 4e-

.: 4 mole of e- produce 1 mole of O2 (24000cm3)

7.a

* + 1. a) i)Numberofatomsofanelementinonemolecule

1. Volumeoccupiedbyonemoleofagasats.t.por r.t.p

b)i)Whengasesreact,theydosoinvolumeswhich bearsimpleratiotooneanotherandtothevolumeof gaseousproducts provided all volumes are

measuredatstandardtemperatureandpressure ii) 2H2S(g)+3O2(g)2SO2(g)+2H2O(l)

2 vol 3vol 2 vol 10cm3 40cm3 10cm3 2 vol 10cm3

2 vol 10cm3

3 vol 10 = 15cm3

2

Amount remaining 40 - 15

= 25cm3total volumes = 25 + 10

= 35cm2

made up of 10cm3 of SO and 25cm3 of oxygen

c) i) 1000cm3 of Na CO  0.02 moles

200cm3

200 x 0.02

1000 = 4.0 x 10-3moles

= 4.0 x10-3moles