**233/1**

**CHEMISTRY**

**PAPER 1**

**MARKING SCHEME.**

1. i) To increase surface area of contact with propanone (solvent) 1

ii) Evaporation, because propanone being more volatile than oil,it will evaporate

first leaving oil. 1

2. i) Reduction

ii) Zinc or Zn

1. Pollution due to release of sulphur (IV) Oxide to the atmosphere which dissolves in rain for resulting it formation of acid rains which corrodes building, destroys plants etc.

3. i) The boat was cooled with hydrogen still passing over it to avoid re-oxidation1 of

the hot metal.

1. Mass of metal R = 16.41 – 10.20

= 6.21g

Mass of oxygen = 17.37 – 16.41

= 0.96g

Metal R O

|  |  |
| --- | --- |
| Mass 6.21  Mole ½  6.21  207  0.03  Ratio 0.03  0.03  1 | 0.96  0.96 ½  16  0.06  0.06  0.03  2 |

***Empirical formula is RO2  ½***

1. Chlorine bleaches through oxidation hence permanent which sulphur (IV) Oxide gas bleaches through reduction hence temporary.
2. Ethanol does not ionze  ½ in water ; hence stays as a molecule  ½ 1mk
3. A-  1 sharp transition ( melting  1 boiling point) temperature
4. A-  1 because it dissolves / separate none pigments  1
5. a) i) Cathode – Hydrogen gas – ( ½ mk)

ii) Anode – Oxygen ( ½ mk)

b) The concentration of electrolyte increase since waste is being discharged / removed

from solution.

1. i) Compound M is concentrated Sulphuric acid  1 .It dries  1 sulphur (IV) oxide gas.

(It is a drying agent)

* 1. Potassium dichromate paper changes from orange to green.

 ½  ½

1. i) A- Making a mixture  ½

B- Making a compound  ½

ii) Using a magnet  1 which will attract iron and leave sulphur  1

1. a) i) A

ii) B

iii) The precipitate formed of Cu(OH)2 dissolved in excess of ammonia

solution to form a complex solution Cu(NH3)42-

Hence reduction of amount of precipitation  1

1. a)

H H H



H - C - C - C - H 1



H H H

b) U.Vlight 1

1. a) S- Rhombic Sulphur  ½

T- Monoclinic Sulphur  ½

X – Nitrogen (IV) Oxide  ½

Z – Sulphur  ½

b) Black solid is observed  1

c) Fe(s) + S(s) FeS(s) bal  ½

(black) St S1  ½

1. i) P to remove CO2 ½

Q to remove O2 ½

ii) P = Potassium / Sodium hydroxide  ½

Q = heated copper metal  ½

iii) 2Cu(s) + O2(g) 2CuO(s) B.E = ½

s.s = ½

0.1

1. a) -C = C - ½

H –H  ½

b) B.BE = 612 + 432 = 1044 kJ  ½

BFE = 347 + 2 ( 413) = 1173 kJ  ½

H = BBC + BFE

= 1049 +-1173 = 12 9 kJ /mol penalise 1mk for wrong units

1. a) Protons = mass number – neutrons.

= 34 – 18 = 16 ½

B= 2 : 8 : 6 ½ 1mk

b) Group 6  ½ period 3  ½ 1mk

1. a)i) Reaction where rate of forward reaction balances / equals the rate of backward reaction.

b) The mixture becomes more / yellow. The hydroxyl (OH-) ions reacts with hydrogen- H+ ions reducing their concentration. Hence equilibrium shifts to the left to counter the decrease of H+ ions in the mixture.

1. a) Blue flame1 / colourless irritating gas.

b) Combustion 1

c) S(s) + O2(g) SO2(g) st  ½

bal  ½

1. E.M.F = Red  - oxide 

= + 0.34 – -0.44 = + 0.78v

1. a) N2O(g)  extinguishes freely burning sulphur while oxygen does not.

N2O(g) fairly soluble in cold water while oxygen is insoluble.

N2O(g) does not give brown fumes with NO(g) while oxygen does

N2O(g) has a sticky sweet smell while oxygen has no smell (Any 4 each 1)

b) N2O is used as an aesthetic during dental surgery 1

1. a) Ammonia reacts 1 with concentrated sulphuric acid and calcium Chloride to

form Ammonia sulphate

OR

CaCl2(s) + 4NH3(g) CaCl2 4 NH3

2NH3(g) + H2SO4(l) (NH4)2 SO4(aq)

b) Calcium Oxide (CaO) 1

1. When boiled ca2+, mg2+ and HCO3- ions are removed due to formation of precipitate of CaCo3 and MgCO3.  Hence decrease of ions in the solution and consequent decrease of ions in the solution and consequent decrease of conductivity.

-When washing suds is added, MgCO3 and CaCO3 are precipitated but solution contains Na+ and HCO3 which conducts electricity. 1mk

1. a) O

 ½  ½ 

H - O - CH2CH2 – OH, HooCC6H4 – C – OH

b) Condensation polymerization 1

1. 48 24 12 6

**Either OR**

Number of half-lifes = 3 ½ mk

3 t ½ = 180 days 1mk m = ( ½ ) T 

t ½ = 60 days ½ mk t/ ½

A = 223  6/48 = ( ½ ) 18 t/ ½

Z = 89 (1/8) = ( ½ )

(1/8)3 = ( ½ ) 18/ t/ ½

180 = 3

t/ ½

t/ ½ = 18 = 60 days

3

1. Add Lead (II) Oxide  ½ to Nitric (V) Acid to obtain lead (II) Nitrate .

Filter  ½ to remove excess oxide

Add dilute sulphuric ½ acid to the lead nitrate solution to obtain lead sulphate ½ .

Filter to obtain lead suplhate  ½ solid. Wash it with distilled water.  ½

1. a) Ionisation energy is the amount of energy required to remove electrons from elements 1mk.

b) Once an electron has been lost ½ from an atom, the overall positive  ½ charge

holds; the remaining electrons more firmly ; 1 mk

1. Strong heat  1 from burning magnesium extracts oxygen ; from carbon  1 hence continue to burn.(2mks)
2. i) P = C(s) + O2(g) CO2(g) ( 1mk)

R = CO2(g) + C(s) CO2(g)  1 ( 1mk)

ii) Open all the windows or jiko to burn in  1 well ventilated room to avoid suffocation

from Carbon (II) Oxide ( 1mk)

1. i) Cracking  ½
   1. Combustion  1
   2. Dehydration of alkanol  1