$2CH_3OH + 2O_2 \rightarrow 2CO_2 + 4H_2O$

$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

$CH_3-CH_2OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$

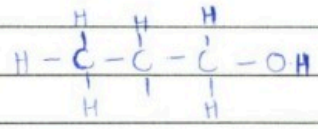
Use for rough work

Q. No. 2 Part (i) Structural & Displayed formula.

- Structural:-

$CH_3 - CH_2 - CH_2 - OH$ (Propan-1-ol)

- Displayed :-



Propan-1-ol.

Q. No. 2 Part (ii) Concentration in Mol/dm^3.

Sol: Mass in grams = 20g

Molar Mass of NaOH = (23)+(16)+(1) = 40g

Volume = 1 dm^3

First

Moles of NaOH = $\frac{\text{Mass}}{\text{Molar Mass}}$

Moles = $\frac{20}{40}$

moles = 0.5

Now

Molarity = $\frac{\text{moles}}{dm^3 \text{ of solution}}$

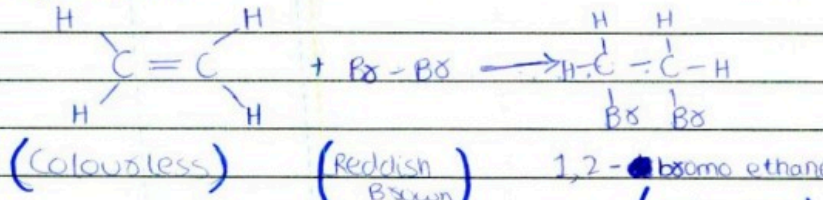
Molarity = $\frac{0.5}{1}$

Molarity = 0.5 mol/dm^3

Q. No. 2 Part (iii) Unsaturated Hydrocarbon with Bromine.

Bromine is reddish brown in colour when bromine is added to unsaturated hydrocarbon like ethene the colour disappears. This reaction is used to detect unsaturation.

Equation:-



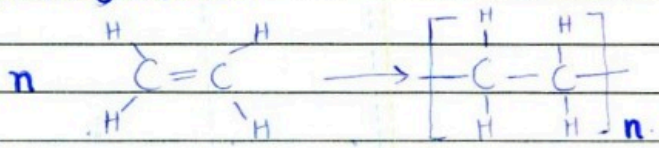
(Colourless) (Reddish Brown) 1,2 – bromo ethane (colourless)

Q. No. 2 Part (iv) **Polymers:-**

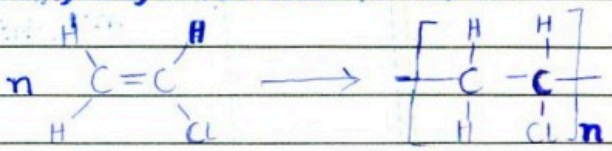
A polymer is a large compound formed from the small molecules called monomers

Example:-

1) Polyethene:



2) Poly Vinyl Chloride (PVC)



Vinyl Chloride Poly Vinyl Chloride

Q. No. 2 Part (v) **Metal with dilute Acid:-**

When metal reacts with dilute acid salt and hydrogen gas are formed

Metal + dilute Acid → Salt + H_2 gas

Example:-

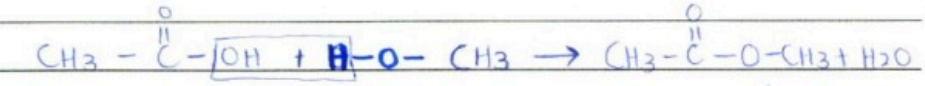
$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

Q. No. 2 Part (vi) **Esterification:-**

When alcohol is added to a carboxylic acid an estes is formed and the reaction is called esterification reaction.

Example:-

Methanol and Ethanoic Acid



Ethanoic acid Methanol Methyl Ethanoate

Q. No. 2 Part (vii) **CaO as basic Oxide:-**

Yes, CaO is basic oxide.

→ CaO is considered a basic oxide because it produces/forms a base when reacted with wates.

~~Example~~ Equation:



Q. No. 2 Part (viii) Molecular Formula Calculation.

Molar Mass = 180 g/mol

Molar Mass of Empirical formula (CH_2O)

$= (12) + 2(1) + 16$

$= 30$ g/mol

$n = \frac{\text{Molar Mass}}{\text{Empirical formula molar mass}}$

$= \frac{180}{30} = 6$

Molecular formula = $(\text{Empirical formula})_n$

$= (CH_2O)_6$

Molecular formula = $C_6H_{12}O_6$

اپنے جوابات (سوالات اور جز کے لئے) مختص جگہ پر تحریر کریں۔
Answer the Question/(Part) at the space specified.
(Section B)

Q. No. 2 Part (ix) Concentration in g/dm^3

Moles of KNO_3 = 0.25

Molar Mass of KNO_3 = $(39) + (14) + (3 \times 16)$

=

Volume = 1 dm^3

First

Mass of KNO_3 = mole × Molar Mass

= 0.25 × 101

Mass of KNO_3 = 25.25g

Now:

Conc. in g/dm^3 = Strength

So

Strength = $\frac{\text{mass of solute}}{\text{Volume}}$

Strength of solution = $\frac{25.25}{1}$

Strength of solution = 25.25 g/dm^3

Q. No. 2 Part (x) Complete Combustion of Alcohol:-

Methanol Combustion.

$$2\,CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O + \text{Heat}$$

Ethanol Combustion:

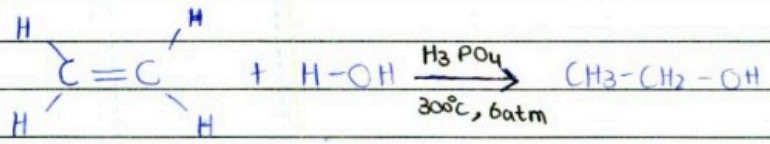
$$CH_3-CH_2-OH + 3O_2 \rightarrow 2CO_2 + 3H_2O + \text{Heat}$$

Products:-

→ Carbon dioxide (CO_2)

→ Wates (H_2O)

Q. No. 2 Part (xi) Balanced Equation :-



Q. No. 3 (Page 1) Four Petroleum fractions:-

	Uses
1) Liquified Petroleum Gas.	Used for heating, cooking, lighting in homes
2) Petrol	Fuel for car engines, and used for burning
3) Diesel	Used as a fuel for diesel engines of buses, trucks and trains
4) Lubricating Oil	Used as a lubricant in machinery, engine parts etc
5) Bitumen.	It is used for paving roads.

Q. No. 3 (Page 2)

Q. No. 4 (Page 1) **Classification of Oxides :-**

1) SO_2 :-

SO_2 is classified as an acidic oxide due to its chemical properties. When it reacts with water it produce an acid. indicating its acidic nature.

Equation :-

$$SO_2 + H_2O \longrightarrow H_2SO_3$$

Sulphurous acid.

2) CuO

CuO is basic in nature. when it reacts with water it produce a base indicating its basic nature.

Equation :-

$$CuO + H_2O \longrightarrow Cu(OH)_2$$

Copper Hydroxide.

3) Al_2O_3 :-

Q. No. 4 (Page 2)

Al_2O_3 is classified as amphoteric oxide because it can react with both acids and bases due to which it is amphoteric.

Equation :-

- **with acid :-**

$$Al_2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$$

- **with Base :**

$$Al_2O_3 + 2NaOH + 3H_2O \longrightarrow 2NaAl(OH)_4$$

Q. No. 5 (Page 1)

Empirical Formula & Molecular Formula

Molar Mass = 62g/mol

C : H : O

38.71% : 9.68% : 51.61%

= 38.71g : 9.68g : 51.61

Now to find moles divide by molar mass

$\frac{38.71}{12} : \frac{9.68}{1} : \frac{51.61}{16}$

3.225 : 9.68 : 3.225

Now divide all by least number

$\frac{3.225}{3.225} : \frac{9.68}{3.225} : \frac{3.225}{3.225}$

1 : 3 : 1

Empirical Formula = $C_1 H_3 O_1 = CH_3O$

Now, Empirical formula mass =

= (12) + (3×1) + (16)

= 31

Now to find 'n'

$n = \frac{\text{Molar Mass}}{\text{Empirical Formula Mass}}$

Q. No. 5 (Page 2)

$n = \frac{62}{31}$

$n = 2$ ∴

→ Molecular Formula = $(CH_3O)_n$

$= (CH_3O)_2$

Molecular Formula = $C_2H_6O_2$

Q. No. 6 (Page 1)

Electrolysis of dilute aqueous solution of $CuSO_4$ using Cu electrode:-

This process is used for the refining of Cu metal.

In this process impure copper bar acts as anode. When electricity is passed through electrolytic cell, the Cu^{+2} ions from anode move towards cathode and impurities are left in the solution. Pure copper is attached on cathode.

Copper obtained is 99.5 % pure.

Reactions

At Anode:-

$$Cu \longrightarrow Cu^{+2} + 2e^{-}$$

At Cathode:-

$$Cu^{+2} + 2e^{-} \longrightarrow Cu$$

Q. No. 6 (Page 2)