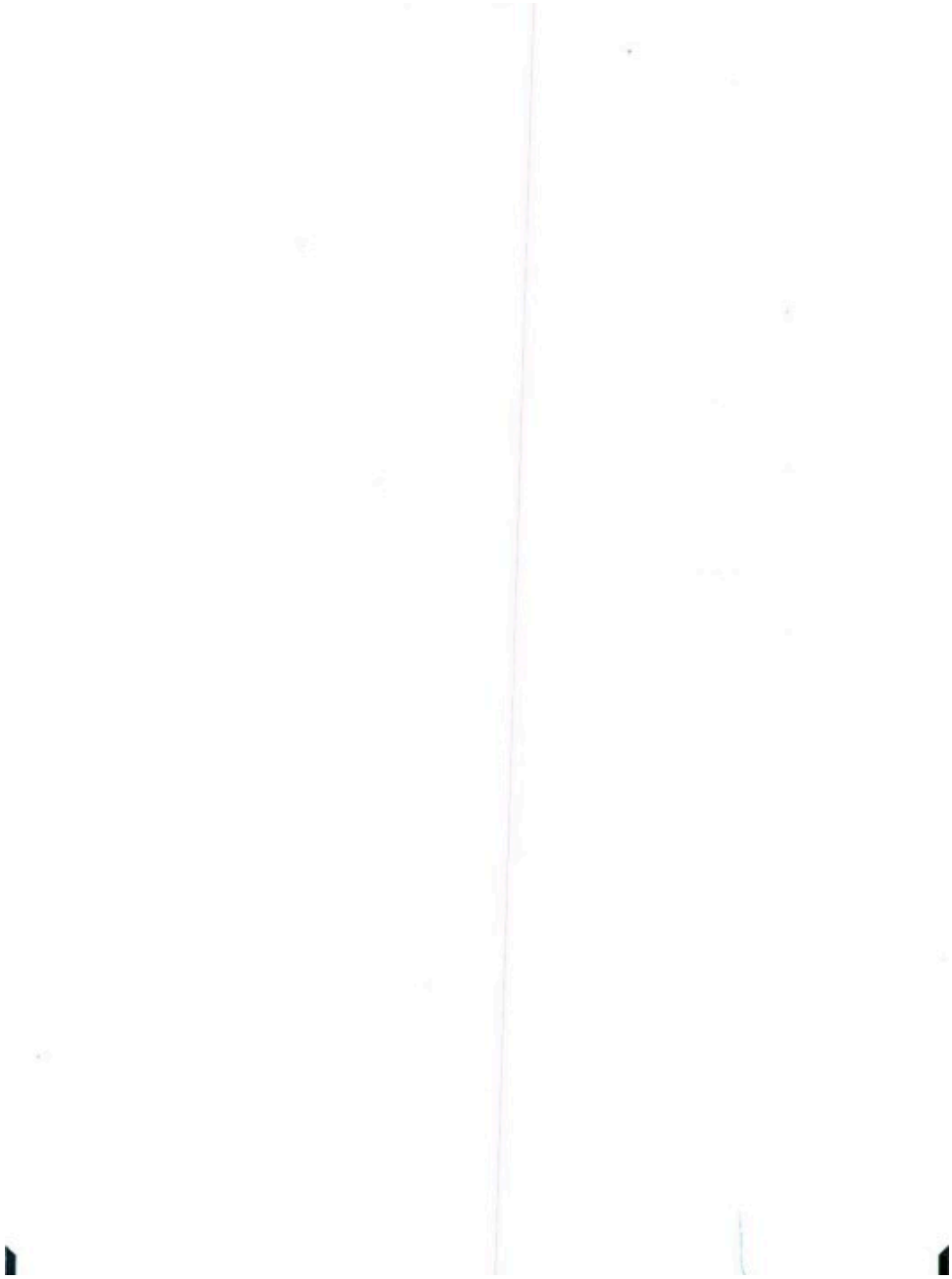
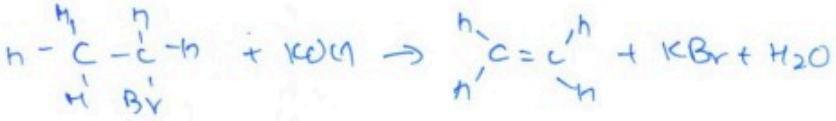


C = 2
H = 6 /4
O = 3 /2

$C_2H_5OH + 2[O] \rightarrow H_2O +$

H = 2
O = 1

CH_3COOH



$Na + H_2SO_4 \rightarrow NaSO_4 + H_2$

$CaO + H_2O \rightarrow Ca(OH)_2$

$2\,CH_3CH_2OH + 3O_2 \rightarrow CO_2 + H_2O +$ hea

C = ~~2~~ 4
H = 6 12
O = ~~7~~ 6

C = 1
H = 2
O = 3

$SO_2 + H_2O \rightarrow H_2SO_3$

$2\,SO_2 + 4HCl \rightarrow 2SCl_2 + 2H_2O$

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

Al = 2
O = 8
Na = 2
H = 8

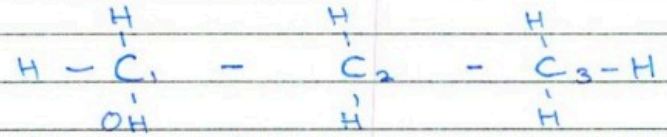
Al = 2
Na = 2
O = 8
H 8

Use for rough work

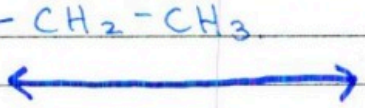
Q. No. 2 Part (i) Propan-1-ol;

'Prop' indicates 3 C-atoms 'ol' indicates '-OH' group meaning it is alcohol and '1' means that hydroxyl group is on ~~fourth~~ first C-atom.

Structural Formula:



Displayed Formula:



Q. No. 2 Part (ii)

Given: NaOH

Mass = 20g

Volume = 1 dm^3

Solution:

Molar Mass = 23 + 16 + 1

= 40

no. of moles = $\frac{\text{Mass}}{\text{molar mass}}$

= $\frac{20}{40} = \frac{1}{2}$

no. of moles = 0.5

Concentration = $\frac{\text{moles}}{\text{volume}}$

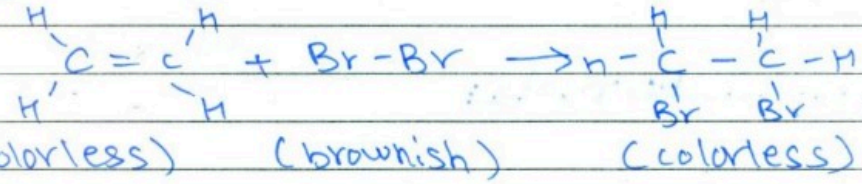
conc. = $\frac{0.5}{1}$

conc. = 0.5 mol/dm^3

Q. No. 2 Part (iii) **Bromine-Test:**

It is conducted to check whether a hydrocarbon is saturated or unsaturated. Saturated (single bond) don't react with Br (brownish color) while unsaturated (multiple bonds react with Br to transform into halogenalkane which is transparent.

e.g:



(colorless) (brownish) (colorless).

Q. No. 2 Part (iv)

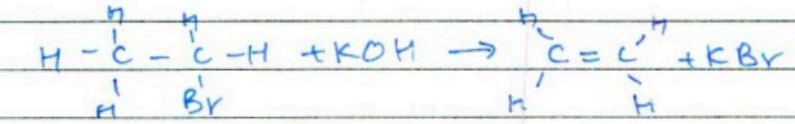
Applications of Electroplating: -

1) Decoration: Cr plating decorate metal into a chrome color which looks extraordinary to the eyes.
2) Prevents corrosion: Tin is electroplated onto cans which stop the can from rusting.
3) Prevents food spoilage: Tin is electroplated onto cans since it is ~~less~~ more inert thus preventing food spoilage.

Q. No. 2 Part (v) **Preparation of ethene from:**

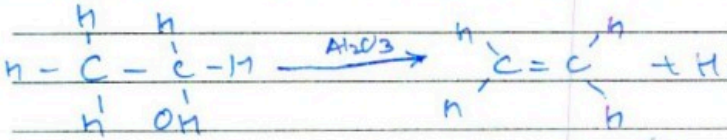
a. Bromoethane:

Bromoethane reacts with KOH to form ethene, water and salt.



b. ethanol:

Ethanol is dehydrated with presence of catalyst Al_2O_3 into ethene and water (dehydrated).



Q. No. 2 Part (vi) **State of ionic compounds:-**

At STP, ionic compounds like NaCl are solid. This is due to their electrostatic forces between the ions which don't let go of the bonds. Their lattice structure between the bonds acts as another barrier making sure the bond does not losen up and transform into a liquid or a gas.

Q. No. 2 Part (vii)

CaO:

Calcium oxide is a basic oxide. This is because it reacts with acids to form salt and water.

$CaO + 2HCl \rightarrow CaCl_2 + H_2O$

(calcium oxide) (Hydrogenchloride) → (calcium chloride) (water)

It also reacts with water to form $Ca(OH)_2$

$CaO + H_2O \rightarrow Ca(OH)_2$

Q. No. 2 Part (viii)

Given:

Emperical Formula: CH_2O

molar mass = 180g.

Solution:

molar mass of e.f = $12+1\times2+16$
$= 30$

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

$(CH_2O)_n$

$(CH_2O)_6$

$C_6H_{12}O_6$ is molecular formula.

Q. No. 2 Part (ix)

Given: KNO_3

moles = 0.25 mol

volume = 1 dm^3

Solution:

mass = moles × molarmass

molarmass = 39 + 14 + 16×3
= 101

mass = 0.25×101
= 25.25g

conc = $\frac{\text{mass}}{\text{volume}}$
= $\frac{25.25}{1}$

conc = 25.25 g/dm^3

Q. No. 2 Part (x)

Vitamin A:

Sources:

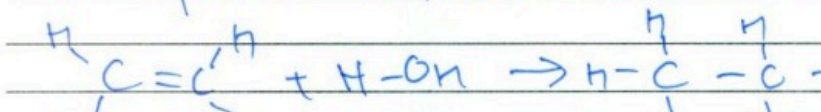
1. egg yolks
2. Carrots.
3. Spinach.

Function:

1. increases eyesight.

Q. No. 2 Part (xi) **Formation of ethanol:**

When steam (H_2O) is added to ethene, it attacks towards the double bond which then becomes alcohol with addition of Hydroxyl (-OH-) group and Hydrogen to form ethanol.

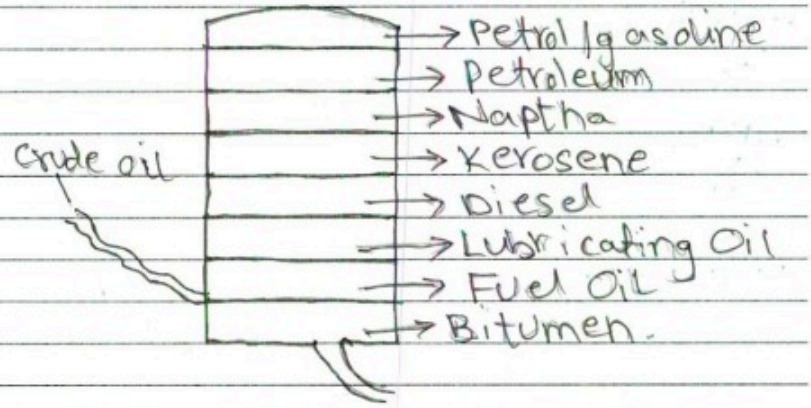


(ethene) + (water) → (ethanol)

Q. No. 3 (Page 1)

CRUDE OIL:

Crude oil is raw form of petroleum and other fuels and substances we use. It is a fossil fuel which has been there for millions of years. At first it can not be used in its raw form it can not be used thus fractional distillation is done to seperate crude oil into different fractions according to their boiling point.



Each fraction is divided and has different temperature according to the substances boiling point.

Q. No. 3 (Page 2)

Substance	C-atoms	uses
1. Gasoline	2-5 atoms	used in houses, cylinders etc. for fire and heat source.
2. Petroleum	4-10 atoms	Used as fuel for vehicles like bikes, cars
3. Naptha	8-12 atoms	Used as synthetic material and used in plastics etc.
4. Kerosene	10-16 atoms	It is used as fuel for aeroplanes and jets.
5. Diesel	14-20 atoms	Used in heavy machinery and trucks and buses.
6. Lubricating Oil	20-50 atoms	It is used in machines and vehicle parts to reduce frichon.
7. Fuel Oil	50-70 atoms	Fuel oil is used in ships as fuel.
8. Bitumen.	More than 70-atoms	Bitumen has a dark pitch black color used in road and cement to give it a black look.

Q. No. 4 (Page 1)

CLASSIFICATION OF OXIDES:

a. SO_2:

Sulphur di-oxide is an Acidic oxide. This is because it reacts with ~~a~~ water to form an acid. This shows that the oxide is not basic nor amphoteric but acidic

$$SO_2 + H_2O \longrightarrow H_2SO_3$$

b. CuO:

Copper oxide is a Basic Oxide. This is because copper oxide reacts with water (H_2O) which than gives product which is a base. Th is show case the fact that it is a base and not acidic oxide

Q. No. 4 (Page 2)

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

c. Al_2O_3:

It is Amphoteric oxide since it reacts with both acids and bases.

With Acids:

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

Reacts with acid to form salt and water.

With base (and water)

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

Reacts with Base and water to form $NaAl(OH)_4$.

Q. No. 5 (Page 1)

Given:

Molar mass = 62 g/mol

Ratio:

C	:	H	:	O
38.71%	:	9.68%	:	51.61%

Solution:

emperical formula:

C	:	H	:	O
38.71	:	9.68	:	51.61
÷12		÷1		÷16
3.23	:	9.68	:	3.23
÷3.23		÷3.23		÷3.23
1	:	3	:	1

So, emperical formula is

CH_3O.

Molecular Formula:

$(e.f)_n$

where,

$n = \frac{\text{molar mass}}{\text{e.f molar mass}}$

Q. No. 5 (Page 2)

e.f molar mass = $12 + 1 \times 3 + 16$

$= 31$

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

$n = 2$

$(e.f)_n$

$(CH_3O)_2$

$= C_2H_6O_2$ is molecular formula

Emperical: CH_3O

Molecular: $C_2H_6O_2$



Q. No. 6 (Page 1)

ELECTROLYSIS:

It is the process in which an electrolyte is used to conduct electricity using electrodes and to force a redox reaction to occur.

- **Electrolysis of $CuSO_4$ with copper electrodes:**

$CuSO_4$ acts as electrolyte when it is put in water, it dissolves into seperate ions.

$$CuSO_4 \longrightarrow Cu^{+2} + SO_4^{-2}$$

This allows it (the molten or aqeous solution to conduct electricity.

Copper electrodes are used. At first at anode, Copper gets oxidized and loses 2 electrons.

Q. No. 6 (Page 2)

at anode:

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

Then the $2e^-$ transfers through a wire from anode to cathode which allows current to pass through. Then the positively charged copper goes toward cathode to get deposited and reduced.

at cathode:

$Cu^{2+} + 2e^- \rightarrow Cu_{(s)}$

