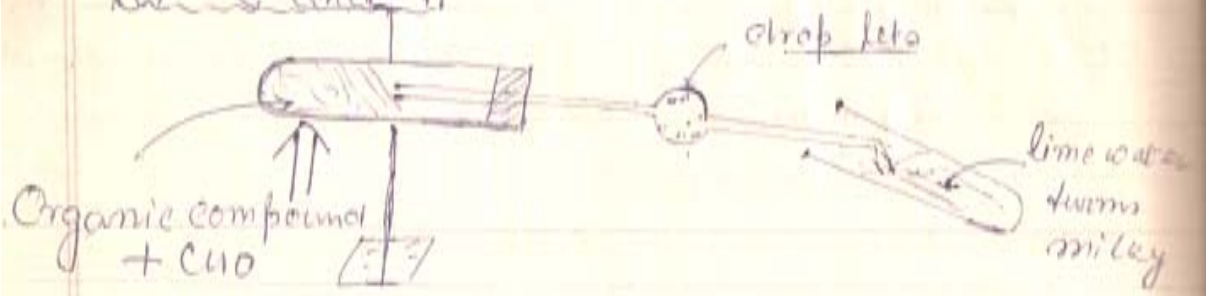
Detection Of Element (Halogens, N_2, S and C, H) In Organic compounds

For C and H



$$C + 2CuO \longrightarrow CO_2 + 2Cu$$

(Of organic compound)

$$2H + CuO \longrightarrow Cu + H_2O$$

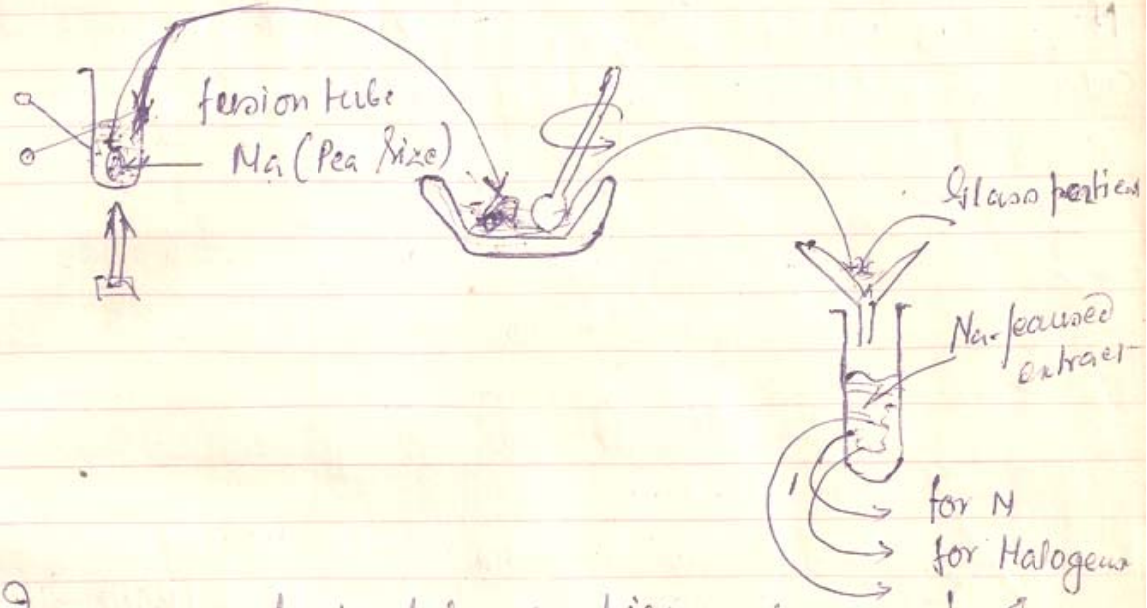
(Of organic compound)

In a hard glass test tube an intimate mixture of CuO and organic substance (may be liquid or solid) is taken and heated as shown in the diagram. On heating the issuing gas turns lime water milky showing the presence of CO_2. Again we know CO_2 contains C therefore the organic substance contain Carbon.

On heating the hard glass test tube we get droplets of colourless liquid in the globe of the delivery tube. It is broken and to this droplets anhydrous CuSO4 (Ash colour) is added. The droplets is water as anhydrous CuSO4 turns blue due

to the formation of $CuSO_4, 5H_2O$.

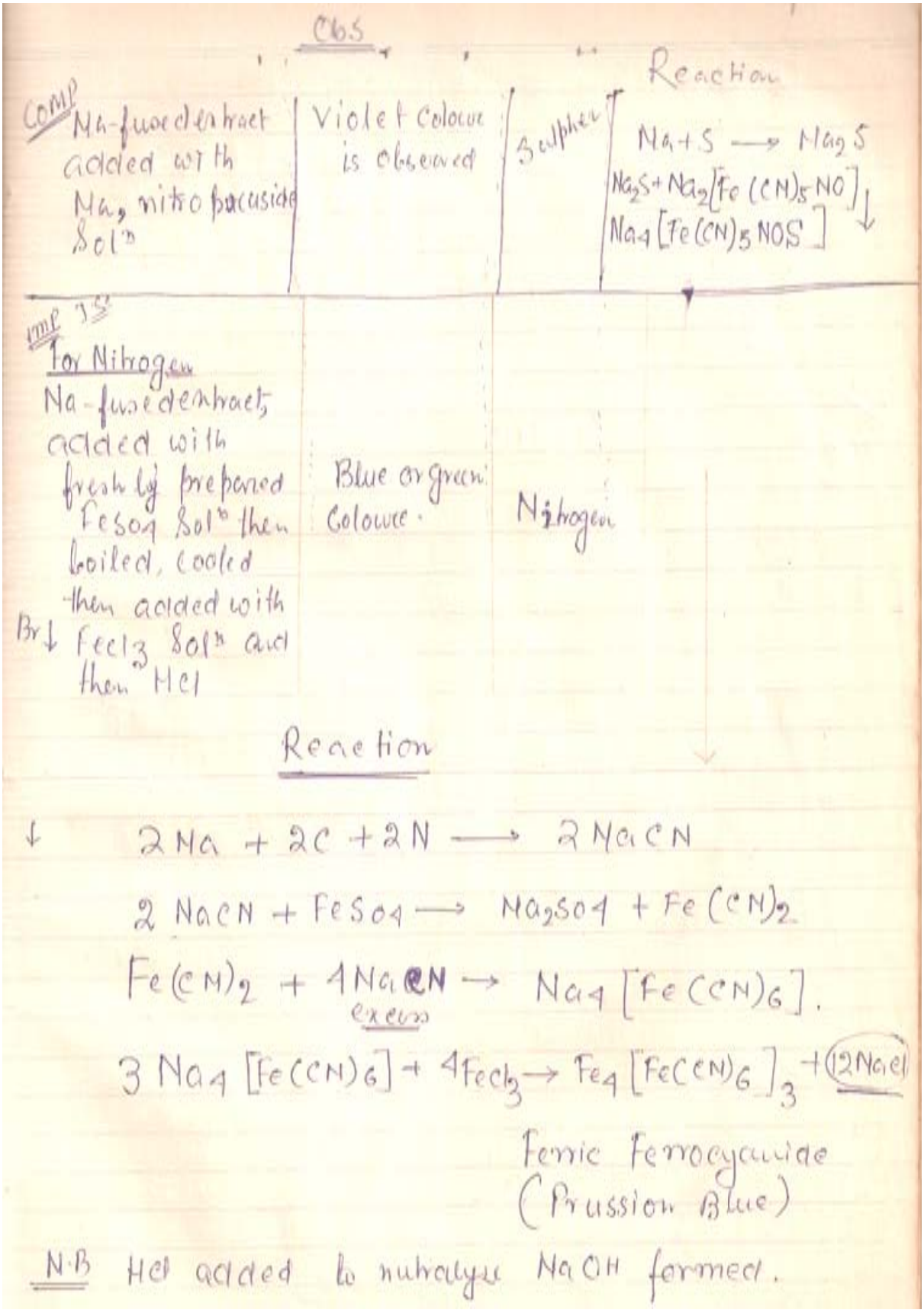
For N, Halogens, S (LASSAGNE'S TEST.)



In a clean fusion tube a piece of Na after rubbing with filter paper to remove Koil., is taken. It is added with a small quantity of Organic Solid / liquid and heated strongly to red-hot. While hot the fusion tube is plunged in distrill water at room temp taken in a motar then it is broken into pieces by the pestle.

It is then filtered to remove the broken glass particles. The filtered is called Sodium fused extract.

Experiment	Obs	Inference	Reaction
For Halogens Na-fused extract is added with same vol. of HNO_3, boiled added $AgNO_3$ sol^n	(a) Curdy white PPT of AgCl Soluble in NH_4OH and insoluble in HNO_3.	Chloride	$Na + Cl \rightarrow NaCl$ $NaCl + AgNO_3 \rightarrow NaNO_3 + AgCl$
	(b) light yellow ppt of AgBr slightly sol^{le} in NH_4OH & insoluble in HNO_3	Bromide	$Na + Br \rightarrow NaBr$ $NaBr + AgNO_3 \rightarrow NaNO_3 + AgBr$
	(c) Deep yellow PPT of AgI insoluble in NH_4OH and HNO_3	Iodide	$Na + I \rightarrow NaI$ $NaI + AgNO_3 \rightarrow NaNO_3 + AgI$
For S Na-fused extract added with a little acetic acid. (to neutralize NaOH formed) Then added lead acetate solution	Black PPT of PbS	S	$2Na + S \rightarrow Na_2S$ $Na_2S + CH_3COOH \rightarrow$ (CH$_3$COO)$_2$Pb ↓ $PbS + 2CH_3COOH$ (black)



CbS

			Reaction
Comp Na-fused extract added with Na_2 nitroprusside Sol^n	Violet Colour is observed	Sulphur	$Na + S \longrightarrow Na_2S$ $Na_2S + Na_2[Fe(CN)_5NO] \downarrow$ $Na_4[Fe(CN)_5NOS]$

Comp IS

For Nitrogen

Na-fused extract, added with fresh ly prepared $FeSO_4$ Sol^n then boiled, cooled then added with Br↓ $FeCl_3$ Sol^n and then HCl

Blue or green Colour.

Nitrogen

Reaction

↓

$2Na + 2C + 2N \longrightarrow 2NaCN$

$2NaCN + FeSO_4 \longrightarrow Na_2SO_4 + Fe(CN)_2$

$Fe(CN)_2 + 4NaCN \longrightarrow Na_4[Fe(CN)_6]$.
(excess)

$3Na_4[Fe(CN)_6] + 4FeCl_3 \rightarrow Fe_4[FeCN)_6]_3 + 12NaCl$

Ferric Ferrocyanide
(Prussion Blue)

N.B HCl added to neutralize NaOH formed.

For Phosphorus

In a crucible it is mixed with Na_2CO_3 and fused, cooled added with conc. HNO_3 then added ammonium molybdate Sol^n we get yellow PPT. (CANARY YELLOW)
This shows the presence of P_i