

# DETECTION OF ELEMENTS IN ORGANIC COMPOUNDS

## PREPARATION OF LASSAIGN'S EXTRACT

1. Take a small piece of dry sodium in a fusion tube
2. Heat the tube slightly on Bunsen burner so that the sodium melts to a shiny globule
3. Add a pinch of organic compound.
4. Heat it slowly to start with so that the compound reacts with sodium metal
5. Now heat the tube strongly till it becomes red hot
6. Plunge the red hot tube into a china dish containing distilled water <sup>(10-20 ml)</sup>
7. Crush <sup>(or stir)</sup> the contents with a glass rod and heat to boiling point.
8. Stop heating and remove the insoluble matter by filtration
9. The filtrate is called Lassaigne's Extract.

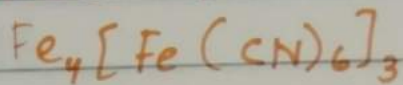
## DETECTION OF NITROGEN

### EXPERIMENT:

To a small portion of Lassaigne's extract add 2ml of freshly prepared ferrous sulphate ( $\text{FeSO}_4$ ) solution and heat. Now add 2-3 drops of ferric chloride solution and acidify with conc.  $\text{HCl}$ .

Observation:

Appearance of a Prussian blue or green coloration.



## 2) DETECTION OF SULPHUR

EXPERIMENT # 1

SODIUM NITROPRUSSIDE TEST

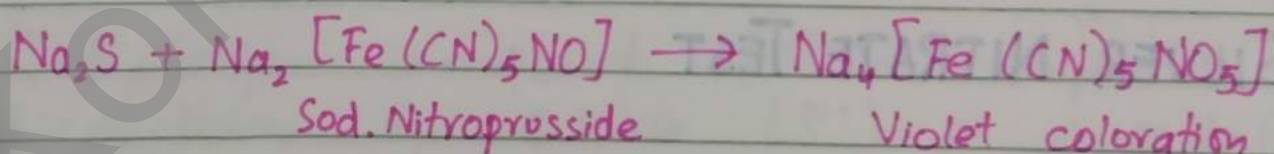
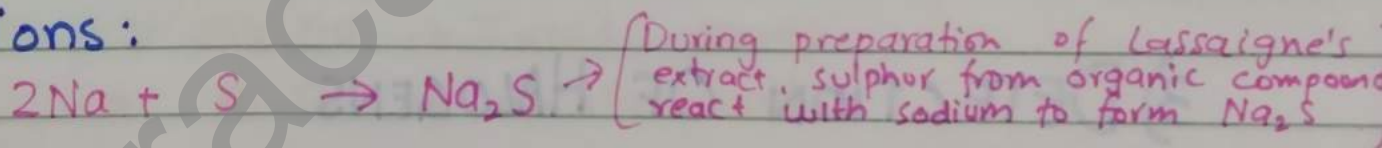
Procedure:

To a small portion of Lassaigne's extract, add a few drops of sodium nitroprusside solution.

Observation:

Appearance of a purple coloration

Reactions:





## EXPERIMENT # 2 LEAD ACETATE TEST

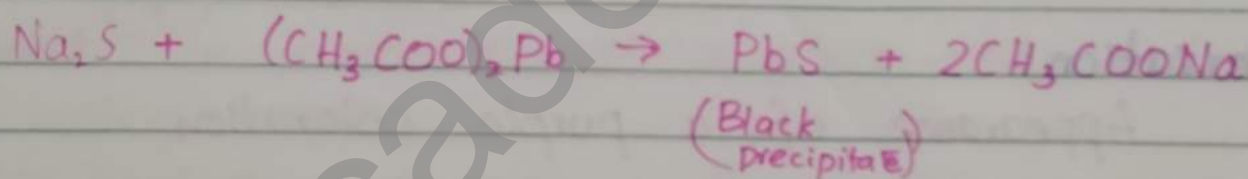
### Procedure:

Acidify a small portion of Lassaigne's extract with a few drops of acetic acid and add a few drops of lead acetate solution. Lead acetate does not precipitate in acetic acid.

### Observation:

A black precipitate forms

### Reaction:



## 3) DETECTION OF HALOGENS

### (i) SILVER NITRATE TEST

#### EXPERIMENT:

To a small portion of Lassaigne's extract add 1ml of conc. nitric acid <sup>(HNO<sub>3</sub>)</sup> and boil for some time. Cool the contents and to it add silver nitrate solution. (AgNO<sub>3</sub>)

## OBSERVATION:

### \* FOR CHLORINE

A white precipitate soluble in ammonium hydroxide forms  $\text{AgCl}$

### \* FOR BROMINE

Pale yellow precipitate sparingly soluble in ammonium hydroxide forms.  $\text{AgBr}$

### \* FOR IODINE

Yellow precipitate insoluble in ammonium hydroxide forms  $\text{AgI}$

## Confirmatory Test:

$\text{AgCl} \xrightarrow{\text{in}} \text{NH}_4\text{OH} \rightarrow \text{dissolve}$

$\text{AgBr} \rightarrow \text{NH}_4\text{OH} \rightarrow \text{Turbid 50-50}$

$\text{AgI} \rightarrow \text{NH}_4\text{OH} \rightarrow \text{Undissolved}$

∴ The organic compound contains sulphur or nitrogen in form of sulphide ( $\text{S}^{2-}$ ) or cyanide ( $\text{CN}^-$ ). So to remove these we add  $\text{HNO}_3$  and they are converted into  $\text{H}_2\text{S}$  and  $\text{HCN}$ . In the presence of  $\text{S}^{2-}$  or  $\text{CN}^-$   $\text{AgNO}_3$  is insoluble (bcz  $\text{Ag}_2\text{S}$  and  $\text{AgCN}$  ppt is formed)