ACIDIC OR BASIC NATURE

1-2 drops of the sample are put on litmus paper (in case of solids, dissolve in small amount of water). Note the change in colour.

Observation	*Inference*	*Examples*
Litmus paper changes from red to blue.	Compound is basic in nature	Amines
Litmus paper changes from blue to red.	Compound is acidic in nature	Carboxylic acid, phenols etc
No change in the colour of litmus paper.	Compound is neutral	Alcohols, esters, aldehydes, ketones

DETECTION OF EXTRA ELEMENTS

For Extra Elemental detection of organic compounds Lassaigne's extract or sodium metal fusion extract is prepared. Lassaigne's extract is prepared to convert non-ionisable organic compound into ionisable inorganic compound.

LASSAIGNE'S EXTRACT

Cut a small piece of sodium metal and dry it by pressing between the folds of the filter paper. Put it in a clean ignition tube. Heat the ignition tube gently until the sodium metal forms a bead. Remove the ignition tube from the flame and add a small quantity (equal to rice grain or 2-3 drops if liquid) of given compound so that it comes in contact with the sodium metal. Continue heating until the rod is red hot. Plunge the red hot tube into 20 ml of distilled water contained in a china dish. Add two more ignition tubes into the same distilled water in similar manner. Crush the tubes with a glass rod, if they are not broken. Stir the contents with glass rod and then boil for five minutes and filter. The filtrate obtained is Lassaigne's extract.

CHEMISTRY INVOLVED

When nitrogen is present

$$Na + C + N \longrightarrow \underset{\text{Sodium cyanide}}{NaCN}$$

When sulphur is present

$$2Na + S \longrightarrow \underset{\text{Sodium sulphide}}{Na_2S}$$

When halide is present

$$2Na + X_2 \longrightarrow \underset{\text{Sodium halide}}{2NaX} \quad (X = \text{Halides like F, Cl, Br, I})$$

When nitrogen and sulphur both are present:

$$Na + C + N + S \longrightarrow \underset{\text{Sodium thiocyanide}}{NaCNS}$$

The above sodium extract is alkaline in nature due to formation of sodium hydroxide.

$$Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow$$

S. no.	Experiment	Observation	Inference
6.	***Test for Unsaturation*** (a) *Test with bromine water:* Dissolve 1 ml of sample in water and add few drops of bromine water.		
	(b) *Baeyer's test:* Dissolve 1 ml of sample in water and add 1 ml of dilute Na_2CO_3 solution and a few drops of KMnO4 solution. Shake well.		
7.	*Nature:* Dip a wet litmus paper in the sample.		

EXTRA ELEMENTAL DETECTION

Lassaigne's extract was prepared for the given sample.

S. no.	Experiment	Observation	Inference
1.	***Test for Nitrogen:*** To 1 ml of sodium extract, add very little quantity of $FeSO_4$ crystals. If precipitate is not obtained add a drop of sodium hydroxide. Heat the contents to boiling and add dilute H_2SO_4.		
2.	***Test for Sulphur*** (a) To 1 ml of sodium extract, add few drops of sodium nitroprusside solution.		
	(b) To 1 ml of sodium extract, add acetic acid followed by lead acetate solution.		
	(c) *Sodium plumbite test:* To lead acetate solution, add a drop of NaOH and observe. Then add excess of NaOH. Add sodium extract.		

RESULT

The given sample contains _____ as an extra element.

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3.	***Test for Nitrogen and Sulphur:*** Take 1 ml of sodium extract, add ferric chloride solution.		
4.	***Test for Halides*** (a) To 2 ml of sodium extract, add dilute HNO_3. Boil the solution to expel H_2S or HCN, if present, and then add few drops of silver nitrate solution.		
	(b) To 2 ml of sodium extract, add dilute HNO_3. Add 1 ml carbon tetrachloride and a few drops of freshly prepared chlorine water.		

RESULT

The given sample contains _____ as an extra element.

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6.	***Test for Unsaturation*** (a) *Test with bromine water:* Dissolve 1 g of sample in water and add few drops of bromine water.		
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