Viva Questions with Answers on Detection of Elements in Organic Compounds

1.Why is sodium metal kept under kerosene oil ?

Ans. Sodium metal reacts with oxygen and moisture present in air. Kerosene oil prevents the contact of air and sodium and thus protects it from the action of moisture and oxygen.

2.Why an organic compound is fused with sodium metal for preparing Lassaigne's extract ?

Ans. When the organic compound is heated with sodium, the elements such as nitrogen, sulphur and halogens, if present in the compound, are converted into sodium salts which are soluble in water. The aqueous solution is then used to identify these elements.

3.Can we use potassium in place of sodium in Lassaigne's test ?

Ans. No. Potassium is too reactive metal and hence dangerous to use.

4. In the Lassaigne's test for nitrogen what is the bluish green colour due to ?

Ans. It is due to the formation of ferric ferrocyanide, $Fe_4[(FeCN)_6]_3$.

5.During the detection of nitrogen, sometimes a blood red colour is obtained. What is this due to ?

Ans. The formation of blood red colour with $FeCl_3$ solution shows the presence of both N and S in the organic compound. It is due to the formation of $Fe(CNS)_3$.

6.Why is fresh solution of $FeSO_4$ used in test for nitrogen ?

Ans. On keeping $FeSO_4$ solution for a long time, it gets oxidised to ferric sulphate by atmospheric oxygen. So, it will not give the desired reaction.

7. What is the function of the addition of HCl in the detection of nitrogen ?

Ans. The function of adding HCl is to dissolve green ppt. of $Fe(OH)_2$ otherwise it may lead to wrong inferences.

8. Why is sodium metal dried up before fusion ?

Ans. It is done to avoid explosion due to of vapours of kerosene oil during heating.

9. How will you test sulphur by lead acetate solution ?

Ans. A portion of Lassaigne's extract is acidified with acetic acid and lead acetate solution is added to it. Formation of black ppt. indicates the presence of sulphur

$$\underset{\text{(In sodium extract)}}{Na_2S} + (CH_3COO)_2Pb \longrightarrow \underset{\text{Black ppt.}}{PbS\downarrow} + 2CH_3COONa$$

10. Why do we use distilled water for the preparation of Lassaigne's extract ?

Ans. This is because tap water contains chloride ions which will give a precipitate of AgCl with $AgNO_3$ solution even if the organic compound does not contain chlorine.

11. In the detection of bromine and iodine, why the CS_2 layer is coloured and not the aqueous layer ?

Ans. Because bromine and iodine are more soluble in CS_2.

12. Why is the sodium extract alkaline in nature ?

Ans. Because the organic compound is fused with sodium metal and then it is extracted with water. The unreacted metal reacts with water and forms an alkaline solution.

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

13. Why is it necessary to break down red hot ignition tube in distilled water ?

Ans. It is done to extract all the fused salts viz., NaCN, Na_2S or NaX with distilled water.

14. What is Beilstein's test ?

Ans. This is a test for the detection of halogens. In this test a copper wire is heated till it stops imparting blue colour to the flame. Then the compound is touched with wire and again heated. If it again imparts blue colour it indicates the presence of some halogen.

15. Why is Beilstein test not sufficient for detection of halogens ?

Ans. This test does not tell us which particular halogen is present. Moreover, there are many compounds which do not contain any halogen but give this test.