

Puspa Shrestha

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Puspa Shrestha

EXPERIMENT NO. 2

NAME OF EXPERIMENT: TO DETECT THE FOREIGN ELEMENT PRESENT IN THE GIVEN ORGANIC COMPOUND.

APPARATUS REQUIRED

- | | | |
|-----------------------|----------------|--------------|
| 1. Beaker | 2. Funnel | 3. Test tube |
| 4. Test tube holder | 5. Fusion tube | 6. Tong |
| 7. Mortar and Pestle. | | |

CHEMICALS REQUIRED

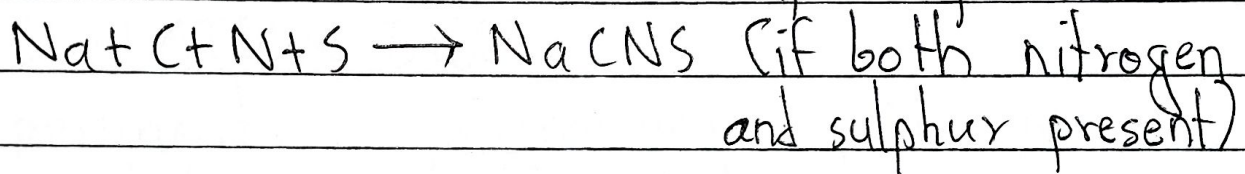
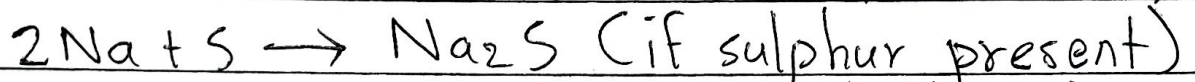
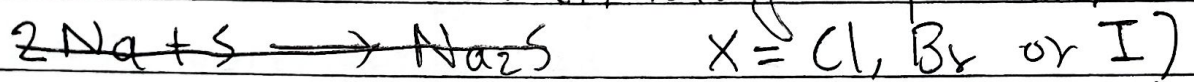
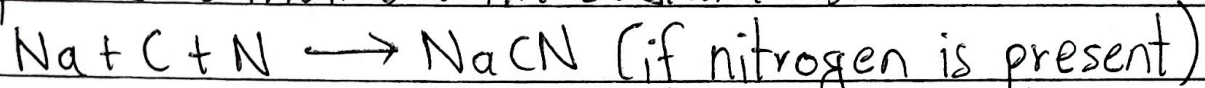
- | | |
|--|--------------------|
| 1. Sodium extract solution | 2. Dil. NaOH |
| 3. Conc. HNO_3 | 4. AgNO_3 |
| 5. NH_4OH | 6. FeCl_3 |
| 7. Conc. HCl or Conc. H_2SO_4 | |

THEORY

Organic compounds are covalent in nature. Foreign elements present in organic compounds are also bonded covalently. Therefore, the laboratory reagents cannot be used for detection. Hence, first these element are converted from the covalent to ionic compounds. These compounds undergo ionic reactions with laboratory reagents. This conversion can be done easily and

effectively by fusing the organic compound with sodium metal.

When an organic compound is fused with metal sodium, the different elements present in the compound combine with sodium as:



PROCEDURE

Small pea size piece of sodium metal was taken. The kerosene oil was soaked by passing the sodium metal ~~in~~ between the folds of filter paper and was put into the clean and dry ignition tube. The ignition tube was held with the help of tong and it was heated gently just to melt the sodium piece. It was cooled and then small amount of organic compound was added. After that, the tube was heated first slowly and then strongly until the entire lower end of the tube become dull red hot. The hot tube was plunged into a mortar

containing 10 cc of distilled water. The tube was broken into small pieces in the mortar with the help of the pestle. In the same way two or three ignition tube was plunged and was grinded with pestle. It was warmed and filtered. The filtrate was called Lassaigne's solution or sodium extract or test solution. This solution was taken and the tests as follows were performed.

OBSERVATION TABLE

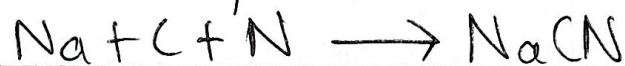
Experiment	Observation	Interference
1. Few ml of NaOH was added in 2ml of extract. Then FeSO_4 was added and boiled. Then the solution was cooled and FeCl_3 and conc. H_2SO_4 was added.	1. Green colour was obtained.	1. Presence of nitrogen
2. Sodium nitroprusside was added in 1ml of extract.	2. Violet colour was obtained.	2. Presence of sulphur.
3. FeCl_3 was added in 2ml of extract.	3. Blood red colour was obtained.	3. Presence of nitrogen and sulphur.

Experiment	Observation	Interference
4. HNO_3 was added in 2ml extract and boiled. Then it was cooled and AgNO_3 was added	4. No ppt was obtained.	4. Absence of Halogens.

REACTIONS INVOLVED

1) Detection of nitrogen

a) While fusing the organic compound with Na metal, no cyanide is produced.

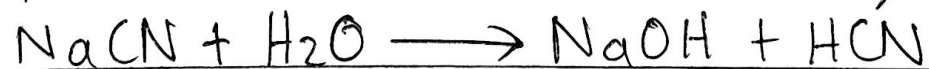


b) The unreacted or excess of Na react with (water and form sodium hydroxide).

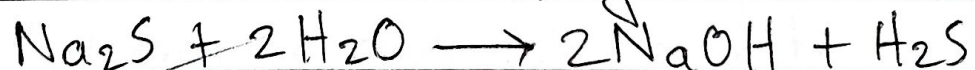
Sodium extract is generally alkaline.



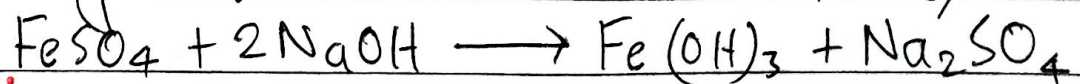
Further, if N or S are present in the sample, Na extract becomes alkaline due to hydrolysis.



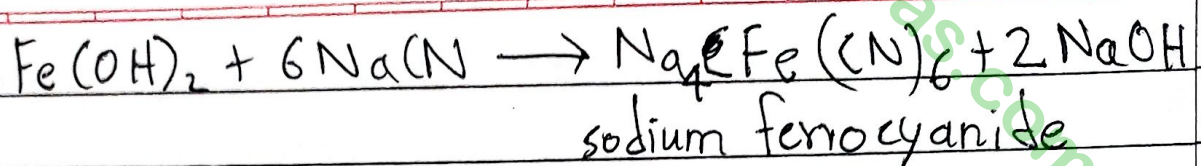
strong base weak acid



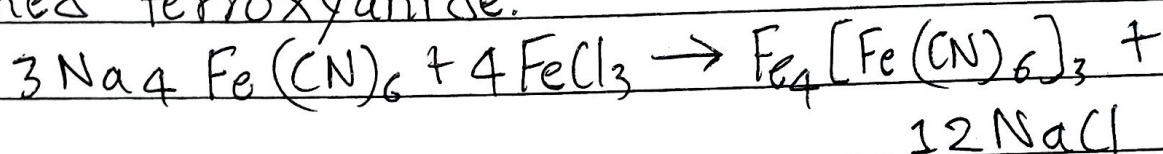
c) On addition of the SO_4 solution to the alkaline sodium extract, a green ppt was formed which on boiling converts to the sodium ferrocyanide



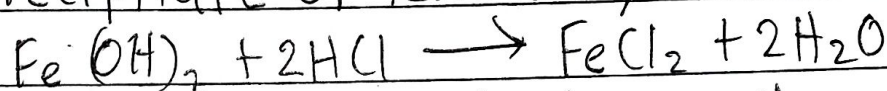
green ppt



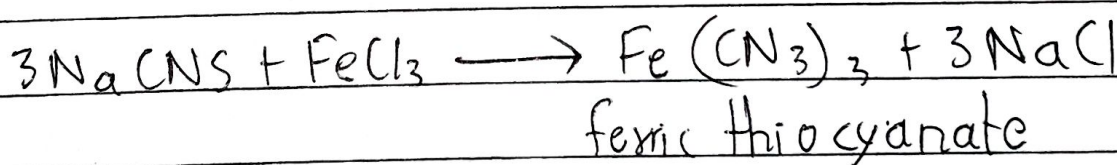
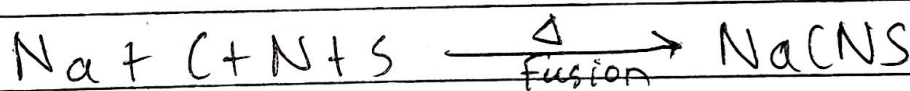
- d) Sodium ferrocyanide reacts with FeCl_3 and gives prussian blue or green coloured compound formed ferroxyanide.



the precipitate of ferrous hydroxide.



if sulphur is also present along with nitrogen in the organic compound, a blood red coloured compound, ferric thiocyanate is produced.



RESULT

Hence, the organic compound was detected and nitrogen ~~was found~~ and sulphur was found as foreign element.

PRECAUTIONS

1. The apparatus should be handled carefully.

2. The fusion tube should be covered while plunging in water.

~~Q~~
07/12/23