

EXTRA ELEMENT DETECTION- BY MS. Lipsa Samal

1) Test for Nitrogen

We can detect cyanide ion and hence, nitrogen ion in the sample by the Prussian blue test. The filtered alkaline solution resulting from the action of water upon the sodium fusion is treated iron (II) sulphate and thus, forms sodium hexacyanoferrate (II).

Upon boiling the alkaline iron (II) salt solution, some iron (III) ions are insensibly produced by the action of air. Now, we add dilute sulphuric acid to dissolve the iron (II) and (III) hydroxides. The hexacyanoferrate (II) reacts with the iron (III) salt, producing iron (III) hexacyanoferrate (II), Prussian blue. A Prussian blue precipitate or colouration indicates that nitrogen is present.



2) Test for Halogens (Nitrogen and Sulphur Absent)

We acidify a portion of the fusion solution with dilute nitric acid. We, then add an excess of silver nitrate solution. A precipitate indicates the presence of a halogen. We decant the mother liquor and treat the precipitate with dilute aqueous ammonia solution. If the precipitate is white and readily soluble in ammonia solution, chlorine is present. In case, it is pale yellow and difficultly soluble, bromine is present. If it is yellow and insoluble, then iodine and bromine may be confirmed by some more tests.

3) Test for Halogens (Nitrogen and/or Sulphur Present)

Cyanide and sulphide ions both interfere with this test for halide by forming silver cyanide and silver sulphide precipitates. If nitrogen or sulphur is present, we must remove the interfering ions. To remove cyanide and sulphide ions, we have to acidify the fusion solution with dilute nitric acid. Then, we have to evaporate it to half of the original volume to expel hydrogen cyanide and/or hydrogen sulphide which may be present.