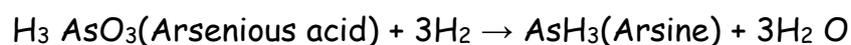
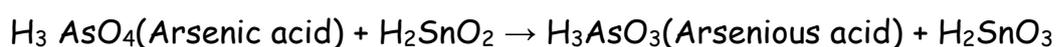


Principle and procedure involved in the limit test for Arsenic

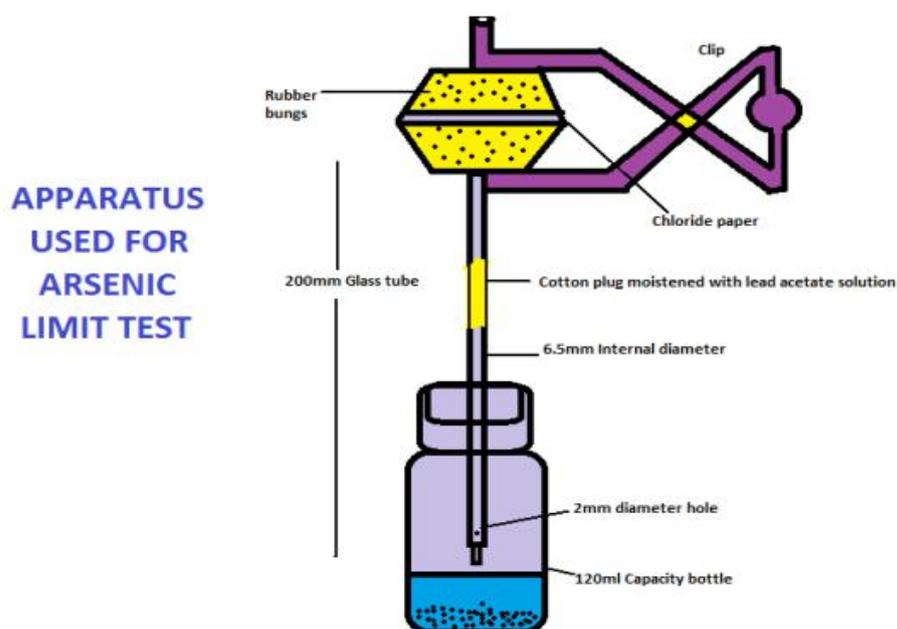
Principle:

Limit test of Arsenic is based on the reaction of arsenic gas with hydrogen ion to form yellow stain on mercuric chloride paper in presence of reducing agents like potassium iodide. It is also called as Gutzeit test and requires special apparatus.

Arsenic, present as arsenic acid in the sample is reduced to arsenious acid by reducing agents like potassium iodide, stannous acid, zinc, hydrochloric acid, etc. Arsenious acid is further reduced to arsine (gas) by hydrogen and reacts with mercuric chloride paper to give a yellow stain.



The depth of yellow stain on mercuric chloride paper will depend upon the quality of arsenic present in the sample.



Procedure:

It consists of wide-mouthed bottle of about 120ml capacity and is fitted with a rubber bung through which passes a glass tube of length 200mm and an internal diameter of exactly 6.5mm

The tube is constricted at its lower extremity to about 1mm diameter and a hole, not less than 2mm in diameter, is blown in the side of the tube, near the constricted part.

The bung is inserted in the bottle containing 70ml of liquid and the constricted end of the tube is above the surface of the liquid and the hole in the side is below the bottom of the bung.

Test solution:

The test solution is prepared by dissolving specific amount in water and stannated HCl (arsenic free) and kept in a wide mouthed bottle.

To this solution 1 gm of KI, 5 ml of stannous chloride acid solution and 10 gm of zinc is added (all this reagents must be arsenic free) Keep the solution aside for 40 min and stain obtained on mercuric chloride paper is compared with standard solution.

Standard solution

A known quantity of dilute arsenic solution is kept in wide mouthed bottle and rest procedure is followed as described in test solution.

Reasons:

Stannous chloride is used for complete evolution of arsine

Zinc, potassium iodide and stannous chloride is used as a reducing agent

Hydrochloride acid is used to make the solution acidic

Lead acetate pledger or papers are used to trap any hydrogen sulphide which may be evolved along with arsine.