

Aim:-

To perform the chemical assay of Boric acid.

Reference:-Requirement:-

- a) Glassware :- Conical flask, beaker, burette, funnel, glass rod, dropper etc.
- b) Reagents :- Boric acid (2.0 g), glycerine (100 ml), 1N sodium hydroxide solution (NaOH), and 0.5% Phenolphthalein solution.

Preparation of Reagent:1N NaOH:

Accurately weigh 40 g of sodium hydroxide in sufficient quantity of water in a volumetric flask and make up the volume upto 1000 ml with distilled water.

### Observation and Calculation :

S.No	Starting point	End point	Vol. consumed
1.	8.4	11.0	2.6
2.	11.0	14.0	3
3.	14.0	16.5	2.5

$$\text{Avg. vol. consumed} \Rightarrow \frac{2.6 + 3 + 2.5}{3}$$

$$= \frac{8.1}{3} \Rightarrow \underline{\underline{2.7}} \text{ ml.}$$

$$\% \text{ purity w/w} = \frac{\text{ml of NaOH required} \times N \text{ of NaOH} \times 0.06183 \times 100}{\text{Weight of sample} \times 1.0}$$

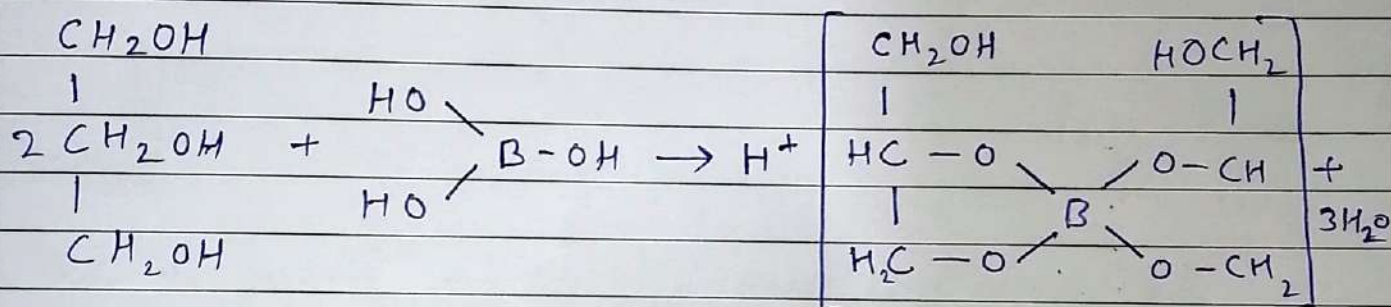
$$\Rightarrow \frac{2.7 \times 1 \times 0.06183 \times 100}{0.4 \text{ g} \times 1.0}$$

$$\Rightarrow \underline{\underline{41.7 \%}}$$



Principle:

Its assay is based upon acid-base titration. Boric acid and hence cannot be titrated accurately with standard alkali, but when dissolved in glycerine water mixture, it acts like a strong monobasic acid and now can be titrated with standard alkali using phenolphthalein as an indicator. The reaction with glycerine is as follows:



Glycerol

Boric acid

Glyceroborate

Procedure:

1. Accurately weigh 2 g of substance and dissolve in 50 ml of water and 100 ml of glycerol previously neutralized with phenolphthalein

2. The solution is titrated against 1N NaOH using phenolphthalein solution as an indicator. At the end point, colour changes to red.
3. Note down the volume of 1N NaOH consumed.

Each 1 ml of 1N NaOH  $\equiv$  0.06183 g of  $H_3BO_3$

### Result:-

The % purity of boric acid by chemical assay was found to be 41.7 %.