

2. Preparation & standardization of Sulphuric acid (0.1 N)- By Ms. Lipsa Samal

Aim – To Prepare & standardize Sulphuric acid (0.1 N)

Glasswares & apparatus required – Volumetric flask, burette, burette stand, pipette, conical flask, digital balance, heating mantle.

Chemicals required – standard 0.1 N sodium carbonate solution (prepared by dissolving 530 mg of sodium carbonate in 100 ml of distill water), conc. Sulphuric acid, methyl orange solution

Theory – Sulphuric acid is a diprotic acid and 1 N solution contain $98.08/2 = 49.04$ g H₂SO₄. Taking into consideration specific gravity (1.83) of sulphuric acid about 49.0 ml of conc. Sulphuric acid is required to prepare 1000 ml solution.

It is an example of alkalimetry. When a strong acid is titrated with a strong base, the salt produced in the reaction is not hydrolysed and therefore the ph of the resultant solution at the end point is exactly 7.0. sulphuric acid is a strong acid, is standardized by titrating with a strong base i.e. sodium carbonate (primary standard). The following reaction takes place when sodium carbonate is titrated with sulphuric acid. In this titration, end point detection is carried out by using methyl orange indicator.

Procedure –

In a volumetric flask, 4.9 ml of conc. Sulphuric acid was taken and 900 ml water was slowly added, cooled and then the volume was made upto 1000 ml with water.

Standardization –

- 10 ml of 0.1 N Sodium carbonate solution was pipette out into a clean and dried conical flask.
- 2 drops of methyl orange indicator was added to it.
- The contents of the flask were now titrated with sulphuric acid until red color was obtained.
- Burette reading was taken.

Observation table –

Sl. NO	Content of the Flask	Burette Reading (ml)				Indicator
		Initial reading	Final reading	Difference	Precision	
1	10 ml of 0.1 n sod. Carbonate	0.0	12	12		Methyl orange

	solution					
2	10 ml of 0.1 n sod. Carbonate solution	0.0	11.9	11.9	12	Methyl orange
3	10 ml of 0.1 n sod. Carbonate solution	0.0	12	12		Methyl orange

Calculation – Normality of H₂SO₄ is calculated by-

$$N_1V_1 = N_2V_2$$

N₁ = 0.1 N = Normality of Na₂CO₃ Solution, N₂ = ? = Normality of H₂SO₄

V₁ = 10 ml = Volume of Na₂CO₃ Solution, V₂ = 30 ml = Volume of H₂SO₄

$$0.1 \times 10 = N_2 \times 12$$

$$\text{Or } N_2 = 1 / 12 = 0.08 \text{ N}$$

Result – Sulphuric acid (0.1 N) was prepared and standardized. The exact normality was found to be 0.08 N