

EXPERIMENT: 03

Aim:

TO PREPARE AND STANDARDIZE SOLUTION OF 0.1M SULPHURIC ACID

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Ch.Id:-ASU/NSP/EB/ APHFTA /2022/Ch-03

ISBN- 978-93-91842-51-2

DOI: <https://doi.org/10.52458/9789391842512.nsp2022.eb.asu.ch-03>

REQUIREMENTS

A. Glassware & Instruments

1. Clean and calibrated burette
2. Pipette
3. Conical flask
4. Burette stand
5. Measuring cylinder

B. Chemicals & Reagents

1. Analyte: 0.1 N H_2SO_4
2. Titrant: Sodium carbonate
3. Indicator: Methyl red

THEORY

This experiment is typically an acid-base titration in which a conical flask containing sulfuric acid is titrated with Na_2CO_3 . In the presence of indicator (Methyl red), passing Na_2CO_3 via H_2SO_4 will transform the solution from yellow to pink. Standard laboratory conditions are used to titrate a standard solution of Na_2CO_3 with H_2SO_4 in this experiment.

PRINCIPLE

The principle of this experiment is that it is acid-base titration. Sulphuric acid and sodium carbonate in presence of methyl red indicator turns the solution red to yellow with release of sodium sulfate and carbon dioxide.

PROCEDURE

H₂SO₄ Preparation

- With constant stirring, slowly add 6 ml of H₂SO₄ to approximately 800 ml of DW.
- Fill up to 1 Ltr with DW.
- Let it cool at 25 degrees Celsius.

Standardization of H₂SO₄ solution

- Accurately weigh approximately 0.2g of anhydrous Na₂CO₃ that has been heated for one hour at approximately 270 °C.
- Mix it with 100 ml of water and 0.1 ml of methyl red solution.
- Slowly add the acid from a burette while stirring continuously until the solution turns a light pink colour.
- Bring the solution to a boil and continue titrating as needed until the light pink colour doesn't change any more as the solution boils.

REACTION



CALCULATION

S. No	Start point	End point	Vol. consumed

Observation table

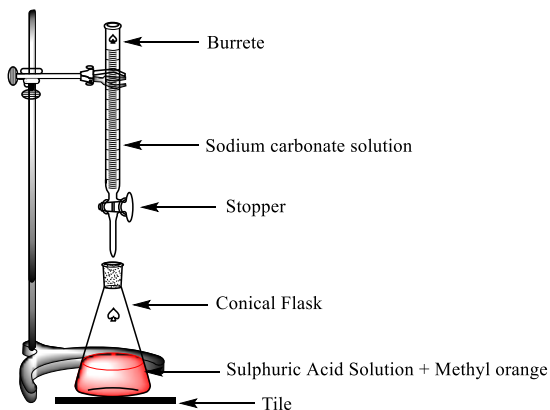
$$M_1V_1 = M_2V_2$$

$$M_1 = M_2 V_2 / V_1 = ?$$

$$N_1 V_1 = N_2 V_2$$

$$N_1 = N_2 V_2 / V_1 = ?$$

DIAGRAM



APPLICATIONS

Uses of H_2SO_4

1. It is used to manufacture fertilisers.
2. In skin ointments, it is used to treat skin disorders such as cancer sores.
3. It is used to destroy the DNA of malignant cells during the production of chemotherapeutic medicines.
4. It is used in the paper industry to produce aluminium sulphate.

RESULT

From the above experiment we can say that Sulphuric acid can be effectively standardized by Sodium Carbonate (Na_2CO_3).

VIVA QUESTIONS

1. How you will prepare 0.1 N NaOH?
2. How you will prepare 0.1 N H₂SO₄?
3. What is the normality of 5% NaOH in water?
4. What is the %age concentration of 3N NaOH in water?
5. What is the molecular weight of H₂SO₄?
6. What is the %age purity of H₂SO₄ available in the laboratory?
7. What is the density of H₂SO₄ available in the laboratory?
8. Define the term standardization.
9. Define the term neutralization curve.
10. Current experiment comes under which type of titration?