Acid-Base Titration

Subject: Chemistry | Grade: Grade 11

Objective:

To determine the concentration of a standard Hydrochloric Acid (HCl) solution using a standard Sodium Hydroxide (NaOH) solution via titration.

Materials:

- Burette (50mL)
- Pipette (25mL)
- Conical Flask (250mL)
- Retort Stand and Clamp
- White Tile
- Phenolphthalein Indicator
- 0.1M NaOH Solution
- Unknown Concentration HCl Solution
- Distilled Water
- Funnel

Procedure:

1. Wash the burette with distilled water and then rinse it with the NaOH solution.
2. Fill the burette with NaOH solution up to the 0.00 mL mark. Ensure there are no air bubbles in the tip.
3. Wash the pipette with distilled water and rinse with the HCl solution.
4. Pipette exactly 25.0 mL of the HCl solution into a clean conical flask.
5. Add 2-3 drops of Phenolphthalein indicator to the flask. The solution should remain colorless.
6. Place the flask on a white tile under the burette.
7. Titrate slowly while swirling the flask until a permanent pale pink color appears (end point).
8. Record the final burette reading. Repeat the titration until concordant results are obtained.

Discussion Questions:

1. Calculate the average volume of NaOH used.
2. Write the balanced chemical equation for the reaction.
3. Calculate the molarity of the HCl solution.
4. Why is a white tile used during titration?