15.Caustic Strength determination

1. Purpose:

To determine the concentration of sodium hydroxide (caustic soda) in cleaning solutions used in food processing equipment.

2. Scope:

Applicable to all cleaning solutions prepared and used in the plant using sodium hydroxide (NaOH).

4. Principle:

Sodium hydroxide reacts with a known concentration of standard hydrochloric acid in the presence of phenolphthalein indicator. The amount of HCl used allows calculation of NaOH concentration.

5. Reagents and Chemicals:

- Standard Hydrochloric acid (HCl), approx. 0.1 N
- Phenolphthalein indicator (1% in ethanol)
- Distilled water

6. Apparatus:

- Burette
- Pipette
- Conical flask
- Beaker
- Glass rod

7. Procedure:

1. Sample Preparation:
   Take 10 ml of the caustic cleaning solution using a pipette and transfer into a clean conical flask. Dilute with 50 ml of distilled water.
2. Add Indicator:
   Add 2-3 drops of phenolphthalein indicator. The solution will turn pink if caustic is present.
3. Titration:
   Fill burette with 0.1 N HCl. Titrate the caustic solution until the pink color just disappears. Note the volume (V) of HCl used.

8. Calculation:

Normality of NaOH (N) = (V × N_HCl) / 10
Strength (% w/v) = Normality × 4.0
Where:
- V = Volume (ml) of HCl used
- N_HCl = Normality of HCl (usually 0.1 N)
- 10 = Volume (ml) of sample taken
- 4.0 = Equivalent weight factor to convert N to % for NaOH