

Experiment : 3

Aim — To determine residual chlorine in a given sample of water. (Starch Iodide Method)

Theory —

Chlorination of water supply is done to destroy or deactivate disease causing micro organisms. It will also improve the quality of water by reacting with ammonia, iron, manganese, sulphide and some organic substances. The residual chlorine is maintained in water to promote the primary purpose of chlorination. This method of determination depends upon the oxidising power of free and combined chlorine residuals. Chlorine will liberate free iodine from potassium iodide solution at pH 8 or less. The liberated iodine is titrated against standard sodium thiosulphate solution using starch indicator.

Apparatus —

1. Burette
2. Glass funnel
3. Conical flask
4. Pipette
5. Electronic balance

Reagents —

1. Acetic Acid glacial (CH_3COOH)
2. Sodium Thiosulphate ($\text{Na}_2\text{S}_2\text{O}_3$)
3. Potassium iodide
4. Starch indicator.

Procedure —

1. Fill the burette with the titrant
2. Take suitable volume of sample. The vol^m should be taken such that amount of titrant consumed should not exceed 20 ml.
3. In the sample add 10 ml of glacial acetic acid.
4. Add 1 gm of potassium Iodide crystals to the sample and stir the sample.
5. Allow it to stand for some time for colour development and mean while note the initial reading. The colour should always be viewed against white back ground.
6. Now titrate the sample till the yellow colour disappears.
7. Add starch solution displaced 1 ml of the supernatant
8. Retitrate till the blue colour disappears.
9. Note down the final burette reading.
10. Repeat the test till concordant value is achieved.

Observation Table —

Total volume Taken = _____ ml

SL NO	Initial Reading	Final Reading	Amount of Na ₂ S ₂ O ₃ sol ⁿ
1.			
2.			
3.			
4.			

Concordant Reading = _____ ml

Calculation —

$$\text{Residual chlorine} = \frac{V_1 \times N \times 35450}{V_2} \text{ mg/L}$$

V_1 = Volume of $\text{Na}_2\text{S}_2\text{O}_3$ used

V_2 = Sample volume

$$N = \text{Normality of } \text{Na}_2\text{S}_2\text{O}_3 = \frac{1}{100}$$

Result —

The amount of Residual chlorine is _____ mg/L in the given volume of sample.

Precautions —

- 1. Burette should be free from impurities.
- 2. While adding reagents, the tip of the pipette should be placed at the bottom of the conical flask
- 3. Solutions should not flow out from the conical flask while stirring.

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