



1. Scope and Objectives

To determine the total alkalinity in water sample by Acid-Base Titration.

2. Principle

The alkalinity of water is a measure of its capacity to neutralize acids. It is primarily due to salts of weak acids, although weak or strong bases may also contribute. Alkalinity is usually imparted by bicarbonate, carbonate and hydroxide.

3. Equipment and Materials

1. Burette
2. Erlenmeyer flask
3. Pipettes

4. Reagents

1. Carbon dioxide free distilled water.
2. Phenolphthalein indicator.
3. Mixed indicator.
4. 0.1 N sodium thiosulphate solution
5. 0.02 N sulphuric acid.

5. Sampling and Preservation

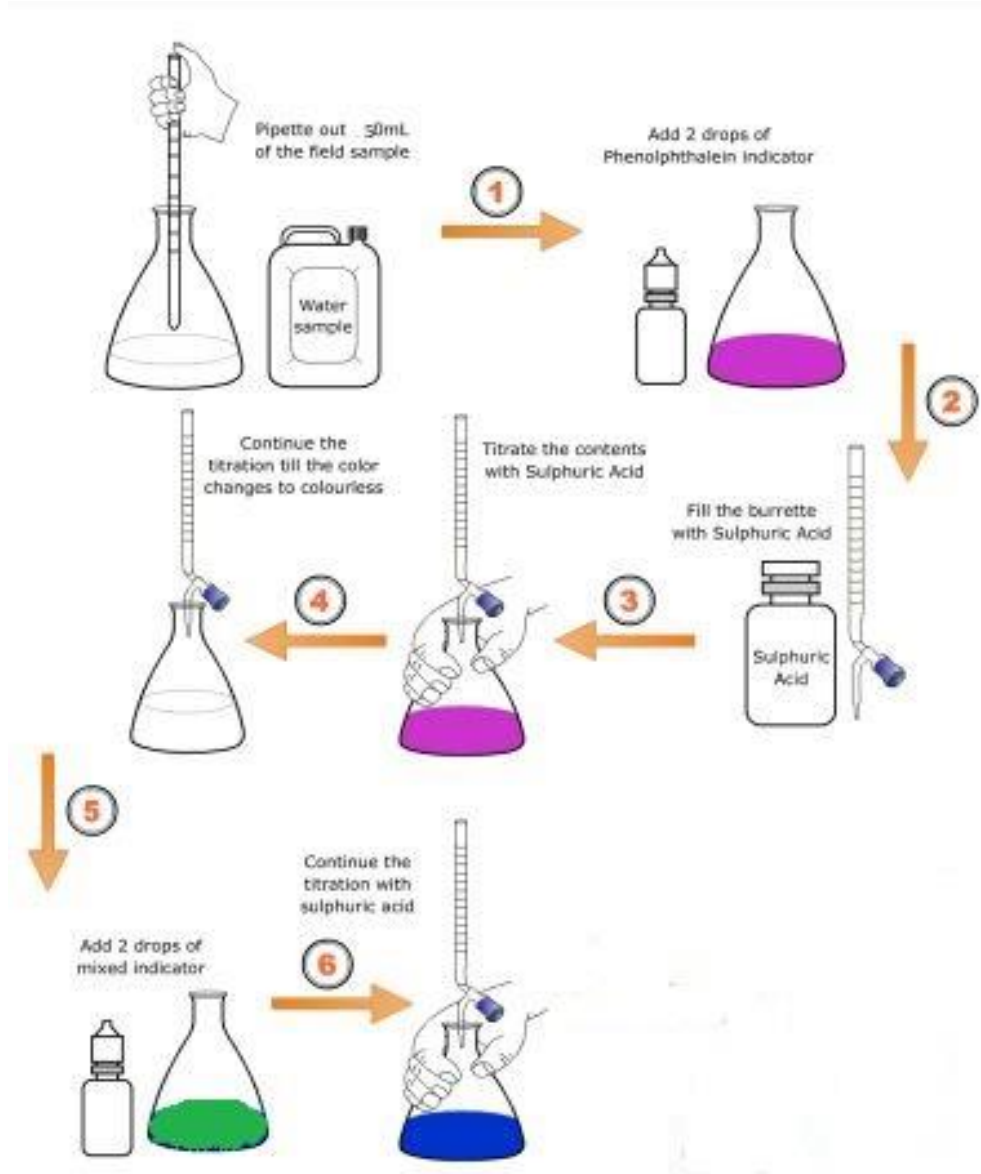
Sample collection will be done according to the water quality monitoring plan and SOPs for sample collection.

6. Procedure

1. Pipette 50 mL of sample into a clean Erlenmeyer flask (V).
2. Add one drop of sodium thiosulphate solution, if residual chlorine is present.
3. Add few drops of phenolphthalein indicator; if the pH is above 8.3, colour of solution becomes pink.
4. Titrate against standard sulphuric acid in the burette, till the colour just disappears. Note down the volume (V1).
5. Then add two mixed indicator, the colour turns green.
6. Again titrate against acid, until the colour turns to blue. Note down the total volume (V2).



2.



7. Precision and bias

Run a blank to check the analyte contamination. Analyse the sample in duplicate to see the precision of method.



8. Calculations

1. Phenolphthalein alkalinity (P) as mg/L CaCO₃ = $\frac{V_1 \times 1000}{\text{mL of sample}}$

2. Total alkalinity (T) as mg/L CaCO₃ = $\frac{V_2 \times 1000}{\text{mL of sample}}$

9. References

- ❖ AWWA, WEF, APHA, 1998, Standard Methods for the Examination of Water and Wastewater (Methods: 2320 B. Titrimetric Method)

Written By:	Puranjan Nepal	
Reviewed By:	Prem Paudyal	
Approved By:	Shailaja Adhikari	