Aim: Determine the Alkalinity of given water samples.

Introduction: The alkalinity of the water is a measure of its capacity to neutralize acids. The alkalinity of natural waters is due primarily to the salts of week acids. Bicarbonates represent the major form of alkalinity. Alkalinity can be expressed as follows: Alkalinity (mol/L) = $[HCO_3^-] + 2\ [CO_3^{2-}] + [OH^-] - [H^+]$

Alkalinity is significant in many uses and treatments of natural waters and wastewaters. As alkalinity of many surface waters constitute of carbonates, bicarbonate and hydroxide contents, it is assumed to be an indicator of these constituents as well. Alkalinity in excess of alkaline earth metal concentrations is significant in determining the suitability of water for irrigation. Alkalinity measurements are used in the interpretation and control of water and wastewater treatment processes. Raw domestic wastewater has an alkalinity less than or only slightly greater than that of the water supply.

Requirements:

Apparatus: Burette, conical flask, pipette, measuring cylinder
Reagents: H_2SO_4 solution, Phenolpthalein indicator, Methyl Orang indicator

Procedure:

1. Fill the burette to H_2SO_4 solution.
2. Take a 100ml water sample in flask. Add few drop of Phenolphthalein indicator.
3. Note the initial reading on burette scale. Titrate against H_2SO_4 till the pink colour disappear.
4. Note the end point reading and get volume of used H_2SO_4 in ml (P) (Concordant value I).

5. Add 1-3 drop of Methyl Orange in same sample flask.

6. Titrate it, till the appearance of light orange colour.

7. Note down the final reading and find the volume of used H_2SO_4.

8. Repeat the steps of using the sample to get concordant value (Concordant value II).

9. Calculate the total alkanity of sample.

Observation:

Phenolphthalein end point   Methyl orange end point

Observation table:

For Concordant value I: Determination of phenolphthalein end point

S.No.	Water sample	Initial Value	Final Value	Ml of H_2SO_4 (P)
1				
2				
3				

For Concordant value II: Determination of methyl orange end point

S.No.	Water sample	Initial Value	Final Value	Ml of H_2SO_4
1				
2				
3				

Calculations:

Total volume of standard H_2SO_4 used for the titration:

T = Concordant value I + Concordant value II

Thus, Phenolpthalein alkalinity = P*1000/ml sample

Total alkalinity (mg/lit of $CaCO_3$) = T*1000/ml sample