7th Semester Civil

Course :- Water Quality Lab.

Course code :- 701-P

EXPERIMENT-1 TO DETERMINE THE ALKALINITY IN A SAMPLE OF WATER

Alkalinity is a measure of the acid-neutralizing capacity of water and is usually determined by titration against sulfuric acid to the endpoint of the acid–base reaction.

Alkalinity has two types :- **Phenolphthalein alkalinity** denoted by (**P**) and the Total Alkalinity denoted by (**T**)

Phenolphthalein alkalinity measures the hydroxides and half the carbonates at a pH 8.3. **Total alkalinity** measures all carbonate, bicarbonate, and hydroxide **alkalinity** at a pH 4.5 (approximately).

DETERMINATION OF ALKALINITY

APPARATUS REQUIRED:

1. Burette with Burette stand and porcelain dishes// Clear flasks
2. Pipettes with elongated tips
3. Conical flask
4. Measuring cylinders
5. Beakers
6. Dropper
7. Stirrer

CHEMICALS REQUIRED

1. Standard0.02N sulphuric acid
2. Phenolphthalein indicator
3. Methyl orange indicator

Sample handling and preservation: Preservation of sample is not practical. Because biological activity will continue after a sample has been taken, changes may occur during handling and storage. To reduce the change in samples, keep all samples at 4°C. Do not allow samples to freeze. Analysis should begin as soon as possible. Do not open sample bottle before analysis.

PROCEDURE:

1. Measure 100 ml of your sample into a 250 ML flask which has been thoroughly cleaned .

2. Add 03 drops of phenolphthalein indicator. If the color of the solution turns pink, titrate your sample with 0.02 N H_2SO_4 until color changes from pink to clear . Record the volume of acid used for the titration. Record the ml of N/50 sulphuric acid used as (P)

3. To the same sample, add 03 drops of methyl orange and continue to titrate with N/50 sulphuric acid until the first pink color appears. Note the volume of acid used as (T)

The various relations between (P) and (T) are given below:-

(a) P=0, alkalinity= T x 10 mg/l (Bicarbonate Alkalinity)

(b) P=T, alkalinity= T x 10 mg/l (Hydroxide Alkalinity)

(c) P= 1/2 T, Alkalinity = T x 10 mg/l (carbonate alkalinity)

(d) P < 1/2 T, Alkalinity =(T-2P) x 10 mg/l (bi carbonate alkalinity)

(e) P > 1/2 T, Alkalinity = (2P-T) x 10 mg/l (Hydroxide alkalinity)

TABLE FOR RECORDING THE OBSERVATIONS

S.No	**Initial Reading (ml)**	**Final Reading (ml)**	**Vol of N/50 acid used**	**P(ml)**	**T (ml)**	**Alkalinity (mg/l)**

Note:- Take three readings for a sample

NOTE:- For live demonstration of the experiment, Visit the below Link

https://www.youtube.com/watch?v=zXvEmlFqicw&ab_channel=NCTEL