



## **STUDY OF TOTAL ALKALINITY PRESENT IN THE POND WATER SAMPLE OF NIPANI TOWN**

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### **Abstract**

*The pond water sample were collected from the vicinity of sugar factory and analyzed every month throughout the year. So, we have studied the total alkalinity in pond water sample. Total alkalinity was extremely high was 51.8 mg/lit.*

*Key words: Pond water sample, Pollutants, Alkalinity.*

### **I. INTRODUCTION**

Due to increased the discharge of domestic wastes , bathing and washing cattle's in ponds near the vicinity of sugar factory created serious problems of water pollution. In developing countries like India, this problem has become acute day by day [1-3].

In the present study, the levels of Total Alkalinity were studied in the vicinity of Halsiddhanath sugar factory located at Nipani. The pond water samples were taken from twelve ponds in the glass bottles by following standard procedure. Samples were taken from twelve ponds which are located at 1. Bhim Nagar, 2. Nagoba lane, 3.Kharade lane, 4. Nirmal mal, 5. Shivaji Nagar, 6. Andolan Nagar, 7. Kamgar Chowk, 8.Ambale plot , 9. Mestri Nagar, 10. Ramling Temple, 11. Mestri Nagar, 12. Bhise lane. The samples were collected every month throughout the every year and analyzed in laboratory for the levels of Total Alkalinity [4-6].

### **II. EXPERIMENTAL SECTION**

#### **DETERMINATION OF ALKALINITY**

Larsel et al (1955) and Thomas et. Al (1960) has suggested different methods for the determination of alkalinity in natural waters in terms of equivalent of CaCo<sub>3</sub>. Titrimetric method was therefore followed in the present work. Hydroxyl ions present in the samples as a result of dissociation or hydrolysis are determined by titration against hydrochloric acid using phenolphthalein indicator and hence, referred to as phenolphthalein alkalinity. The yellow colour changed to pink with methyl orange indicator is called as methyl orange alkalinity. The total of both readings gives total alkalinity present in the water samples[7-8].

#### **REAGENTS –**

- a) Hydrochloric acid (0.1N)
- b) Methyl orange indicator
- c) Phenolphthalein indicator
- d) Sodium carbonate solution (0.1N)- Dissolve 5.3 g of Na<sub>2</sub>CO<sub>3</sub> (previously dried at 250C for about 4 hours) in distilled water and dilute to 1 lit.

#### **PROCEDURE –**

To 100 ml of water sample, two drops of phenolphthalein indicator were added, the solution remains colourless or turns pink depending upon the phenolphthalein alkalinity. If the solution turned pink after the addition of phenolphthalein, the mixture was titrated against 0.1N HCl until end point when colour disappeared. This is termed as phenolphthalein alkalinity (PA).

After that, 2.5 drops of methyl orange were added in the same mixture and titration was carried further until yellow color changed to pink at the end point, which corresponds to total alkalinity (TA). Formula used for the calculations of total alkalinity is

TA as CaCO<sub>3</sub> (mg/lit) = BX Normality of HCl X 1000 X 50/ 50 ml of sample

PA as CaCO<sub>3</sub> (mg/lit)=AX Normality of HCl X 1000 X 50 / 50 ml of sample

Where, A = ml of HCl used with phenolphthalein. B = ml of HCl used with phenolphthalein and methyl orange. PA = phenolphthalein alkalinity TA = Total alkalinity. **RESULTS**

Total alkalinity value varied from as high as in pond water samples i.e. 51.8 mg/lit. (Table no- 1 ) Total alkalinity showed value in winter 134.5 mg/lit. Followed in summer 147.7mg/lit and in rainy season 145.5 mg/lit. In pond water sample highest total alkalinity value observed during summer is due to concentration of alkaline ingredients in water as a result of water evaporation , which slightly increases in rainy season due to facilitated weathering of rocks inspite of dilution with rain water (Goel et . al 1980)

### III. DISCUSSION

Site wise highest total alkalinity was observed at Ramling is near by the point of origin of sugar factory.(Fig No-2 ). In the absence of pollution at the point of emergence is thought to be due to interaction between the rocks and water sampling at sites alkalinity 3,4,20,26 & 27 showed highest value of alkalinity as compared to other site due to discharge of city sewage & domestic waste is mixing in to ponds at budhyal sampling sites . 7.( Andolan Nagar) showed a marginally higher values of alkalinity due to passage of surface water through the rock area. Higher value of alkalinity at (Ambalzari Nala) was observed mainly because of picking point of alkaline waste from sugar factory [12-13].

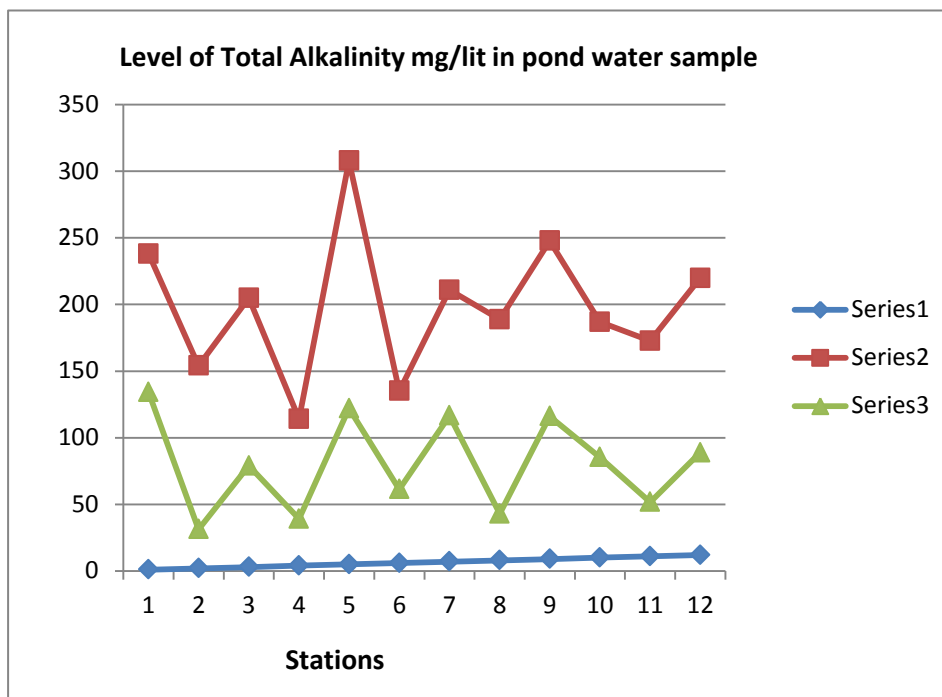
**Table1: Total Alkalinity (mg/lit) in pond water sample during the monitoring period**

Stations	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1	250.30	125.30	158.40	166.50	128.70	215.40	315.50	180.00	420.00	415.40	312.60	116.20
2	112.40	113.50	211.50	175.20	138.50	180.40	280.80	220.10	515.40	240.30	189.60	108.40
3	118.60	124.30	145.20	165.40	180.30	195.50	420.00	244.30	260.50	228.20	175.30	190.30
4	116.30	118.40	220.50	96.30	240.00	220.40	412.30	230.50	250.60	169.00	180.20	200.00
5	128.20	138.20	242.60	87.40	420.50	205.50	140.30	242.00	270.20	175.50	185.30	240.00
6	182.40	145.30	340.00	58.20	353.50	87.40	162.50	220.20	275.20	186.20	196.00	150.50
7	305.50	155.40	320.20	68.40	415.20	96.20	172.60	116.40	162.50	188.00	112.60	415.50
8	420.00	165.30	280.50	78.30	320.40	75.50	182.30	132.40	180.50	198.20	118.40	180.20
9	280.20	175.20	112.40	116.40	330.30	86.20	113.40	149.30	175.40	105.50	138.20	190.30
10	315.20	188.80	115.30	124.80	412.50	94.40	112.20	185.40	190.30	106.40	145.50	225.50
11	514.30	198.20	120.80	110.00	508.00	80.00	110.50	175.50	122.20	113.30	156.40	300.00
12	112.20	200.00	190.30	122.00	245.00	84.20	108.00	168.60	150.00	125.00	162.40	320.20

**Table2: Level of Total Alkalinity (mg/lit) in pond water sample**

Stations	Average	S.D.
1	237.97	134.07
2	153.99	31.33
3	204.8	78.95
4	114.08	39.12
5	307.74	121.94
6	135.09	61.35
7	210.87	116.63
8	188.73	42.93
9	247.73	116.14
10	186.83	85.34

11	172.71	51.77
12	219.76	88.88



**Figure 1**

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[15] ISSN:0975-7384 CODEN(USA):JCPRC5

[16] Y.S.Varale ; *International journal of applied and pure science and agriculture* , 2016 vol.2(10) pg no-72-75  
 ISSN-2394-823X **Impact factor – 3.762**