



Concentration of Free Carbon Dioxide present in Industrial water sample of Nipani Town

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ABSTRACT

The Industrial water samples were taken from Halsiddhnath sugar factory from Nipani town and analysed every month throughout the year. We have studied levels of free carbon Dioxide present in industrial water. Concentration of Free Carbon Dioxide was found higher than the desirable limit of DO (5 mg/ up to 12.56mg / lit). The seasonal analysis indicated that the levels of DO were generally higher in summer and winter than their levels in rainy season.

Key words: Industrial water, pollutant, Dissolved Oxygen (DO)

I. INTRODUCTION

Due to rapidly increased in industrialisation water pollution problem arises. Industrial waste water directly thrown in to the river and it content lot of toxic chemicals and it's adversely affected on plants, animals and human beings also.

In the present study, the levels of free carbon dioxide were studied from vicinity of Halsiddhanath sugar factory at Nipani [1-2]. The industrial water samples were taken in the twelve glass bottles by following standard procedure. . The samples were collected every month throughout the every year and analysed in the laboratory.

II. MATERIALS AND METHODS

Moore (1939) first suggested the method of determination of carbon dioxide and alkalinity in water. The present method is based on the principle that free carbon dioxide reacts with sodium hydroxide to form sodium bicarbonate. Completion of the reaction is indicated by the development of pink colour. Characteristic of phenolphthalein indicator, of the equivalent of pH 8.3.

Reagent-

Sodium hydroxide :

Dissolved oxygen in water was determined with the help of Winklers Iodometric Modified Oxide Method (APHA,1989) . In this method , addition of divalent manganese solution followed by strong alkali to water sample,rapidly oxidize manganese in the form of manganous hydroxide precipitate,giving on ,equivalent amount of dissolved oxygen present in water. free carbon dioxide present in the water sample was determined by using the following formula.

$$\text{Free Carbon Dioxide (mg/Lit)} = A \times N \times 44$$

100

Where ,A= ml of titrant

N= Normality of NaOH (0.03759N)

III. RESULTS AND DISCUSSION

An average concentration of Oxygen in atmosphere is 20 .90% (Whipple and Whipple 1911) The degree of solubility of atmospheric oxygen is a function of temperature and pressure . Dissolved oxygen is a key parameter reflecting the quality of water and hence used in classifying its quality , particularly of water , which receives waste . At site 23, discharge of industrial effluent is responsible for high value of dissolved oxygen. Thus , surface water is highly polluted at these sites due to discharge and degradation of waste resulting in to low level of Dissolved Oxygen values. The depletion of DO values at various confluence's indicated that surface water was polluted and water quality was highly deteriorated during the summer months. The presence of large loads of organic waste has completely changed the balance between oxygen producing and oxygen consuming processes, resulting in to lowering of DO values at various sampling sites.

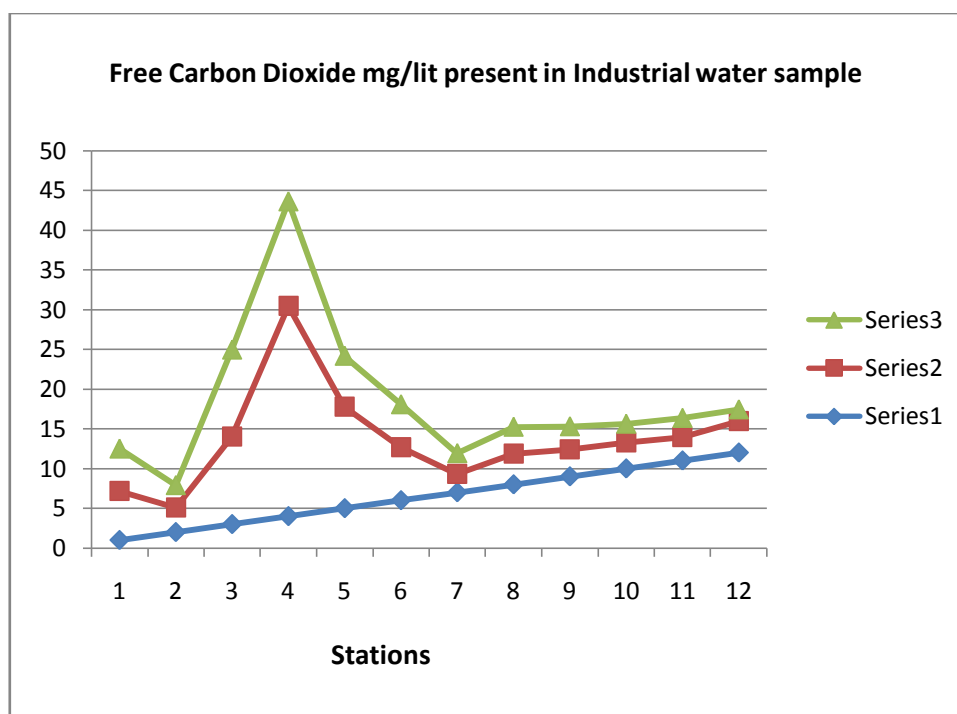
In the present study highest value of DO observed during winter season , Rainy season and further reduction in summer season at various sampling station due to discharge of industrial effluent . The analysis of industrial effluent sample showed an extremely fluctuations in Dissolved oxygen from minimal 2.40 mg/lit in December to maximal 12.46 mg/lit (Table No – 63) consideration of seasonal average showed higher average dissolved oxygen in winter season 8.36 mg /lit , followed in rainy season 10.51 mg /lit and less in summer 5.44 mg /lit . (Table No – 64) . At tvarious site below the minimum expected values prescribed by WHO (1972) .

Table 1: Free Carbon Dioxide (mg/lit) of Industrial water sample

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3.32	3.34	3.34	0.00	0.27	0.00	16.50	11.40	10.90	7.80	6.62	10.50
2	0.00	4.38	0.00	0.00	0.00	0.00	4.90	4.30	4.50	6.40	6.20	6.40
3	1.75	33.02	4.86	3.21	15.50	30.25	5.30	4.91	0.00	4.86	12.50	16.17
4	20.62	42.00	29.74	9.93	33.40	34.57	9.95	4.87	37.39	33.08	19.04	43.00
5	16.87	13.24	4.90	4.96	18.20	20.18	4.95	3.30	17.85	15.25	16.87	16.57
6	4.97	9.82	4.91	5.90	4.87	0.00	1.67	3.31	17.45	16.70	4.82	5.90
7	0.60	1.75	0.00	0.00	4.12	4.15	0.00	0.00	8.20	4.16	0.67	4.17
8	1.38	3.33	11.50	0.00	3.32	0.00	0.00	5.90	4.95	6.60	4.30	5.40
9	1.67	4.40	0.00	4.12	0.00	8.20	0.00	5.40	0.00	5.30	5.40	6.30
10	1.30	3.31	0.00	3.40	4.12	4.75	0.00	6.61	6.62	5.78	1.68	1.60
11	0.60	3.40	3.30	0.00	0.00	4.50	8.20	1.69	1.78	2.30	4.80	4.90
12	1.30	4.95	3.40	2.40	2.60	4.90	5.20	5.15	6.41	3.40	4.78	3.3

Fig. 1: Free Carbo Dioxide (mg/lit) in industrial water sample

Stations	Average	SD
1	6.17	5.34
2	3.09	2.82
3	11.03	10.94
4	26.47	13.16
5	12.81	6.38
6	6.69	5.40
7	2.32	2.62
8	3.89	3.37
9	3.40	2.92
10	3.26	2.38
11	2.96	2.41
12	3.98	1.47



REFERENCES

- [1] Pawar N.J. 1986 Hydro chemical Facies of Shallow Ground Water from the Poona Area, Maharashtra Hydrology of Volcanic Terrain (Ed. Power K. B. and Thigale, S. S. University of Poona, 137-153.
- [2] Petly John w.A. 1972 Water Quality in a Stressed Environment, Burgess Publishing Co., Minnesota .
- [3] Ramteke D.S and Moghe C.A. 1986 Manual on Water and Waste Water Analysis, NEERI Nagpur, 135 .
- [4] Rao . S R., and Shah S.M. 1976 Elemental Concepts in the Environmental Samples BARC, Mumbai .
- [5] Smidth . R. and Wiechers S. C. 1981 Elimination of Toxic Metals from Waste Water by an Integrated Waste Water Treatment, Water Reclamation System. Water, S.A. (Pretoria), 7(1), 65-70 .
- [6] Peter A.K. 1974 Sources and Classification of Water Pollutions, in Industrial Pollution (Ed. N. Irving Sax), Van Nostrand Reinhold Co., Newyork.
- [7] Lohani B.N. 1981 Water Quality Indices in Water Pollution and Management Review
- [8] Rao C.B. 1955 On the Distribution of Algae in a Group of Six Ponds, J. Ecol., 43, 291-308 .
- [9] Salomons W., Van Driel W., Kridijk. H., and Boxma R. 1982 Effects of Waste Water Disposal on Ground Water, Proc. Exeter. Symp., IHAS, 39, 25-29 .
- [10] Raghunath H.M. 1988 Ground Water, Wiley Eastern Ltd. New Delhi, India .