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STUDY OF DISSOLVED OXYGEN PRESENT IN THE GROUNDWATER AROUND AMBARNATH AREA.

Gangotri Nirbhavane*, Kshama Khobragade**

** Assistant Professor, Dr. Ambedkar College of Commerce and Economics, Wadala, Mumbai, India – 400 031.*
***Associate Professor and Head, Dept.of Environmental Science, S.B.E.S.College of Science, Aurangabad, India, (M. S.)-432 001.*

Abstract: *Ambarnath town in Thane, Maharashtra having three major industrial zones. For study purpose seven ground water samples around Ambarnath Chikloli-Morivali industrial area were collected during Jan.2013 to June 2013. Collected Samples were analyzed throughout 6 months for Dissolved Oxygen parameter. Dissolved Oxygen in study area were found between 1.2 mg/l to 5.2 mg/l. Dissolved Oxygen below 5 mg/l, indicates water pollution due to organic material.*

Keyword: *Dissolved Oxygen, Groundwater, Industrial zones, Organic matter.*

I. INTRODUCTION

Since long time groundwater is important resource on earth planet. Available surface water resources are not sufficient to fulfill the increasing demand of man; therefore rely on groundwater sources increases in different parts of the world. Within the last 2-3 decades; demand for groundwater has increases continuously.Rapid growth of population, industrialization, high rate of urbanization and expansion of irrigation activities etc. increases groundwater problem all over India[1] In India, 56 % of metropolitan, class-I and class-II cities are dependent on groundwater either partially or fully [2,3]

Industries play a very important role in the economy of our country. With rapid industrialization, pressure on available resources also increases. Man is not only using natural resources, but he is also discharging the different types of solid, liquid waste material into the same resources, which day-by-day degrading the quality of this vital resources.[4]

In today's scenario, there is a need of the groundwater quality assessment, before using it for any purpose, in any area, as industrialization and urbanization affects the water as well as the groundwater quality.

Ambarnath is an industrially major developed town in Thane district of Maharashtra. Area around Ambarnath Chikloli-Morivali industrial zone was selected for study purpose, as it is situated in main Ambarnath town surrounded by huge residential and slum areas.

II. MATERIAL AND METHODS

For study purpose seven sites around Ambarnath Chikloli-Morivali industrial zone were selected. Water samples were collected monthly from selected sites during Jan.2013 to June 2013. Following sites were selected for study purpose.

Table No.1- Sampling Sites

Sampling Area	Station No.
Kansai Gaon (Ganesh chauk)Open Well	S1
Kansai Hand Pump	S2
Bhimnagar Area,Open Well	S3
Vadavli area (Sevice centre) Bore Well	S4
Bhendipada area Bore Well	S5
Samarth Service Centre Bore Well	S6
Satish Service Centre Bore Well	S7

Samples were collected in clean glass bottles. These bottles were rinsed with the groundwater to be taken for analysis. Collected samples were determined by using Winkler's Iodometric method for Dissolved Oxygen. The water sample was taken in BOD bottle of 300 ml. immediately after collection of sample avoiding air bubbles. 2ml. each of $MnSO_4$ and KI solution was added through pipettes dipping slowly at the bottom of the bottle. Care was taken to create minimum disturbances to the sample during these exercises. The bottle was closed and inverted few times to ensure through mixing of water with the reagents. This resulted in the development of flocculent precipitation, which gradually settled at the bottom. Whitish colour of the precipitate indicated poor status of DO while reddish to brown colour represented moderate to high values of DO.

2 ml. of concentrated H_2SO_4 was added and the stopper bottle was inverted a few times to dissolve the precipitate. 50 ml. of the solution was taken in a 250 ml. conical flask, 0.5 ml. of starch indicator was added to form a blue colour and then titrated against freshly prepared 0.025 N Sodium Thiosulphate. At the endpoint, the blue colour suddenly changed to colourless. [5,6]

Calculation

$$\text{Dissolved Oxygen (mg/l.)} = \frac{(\text{ml} \times \text{N})\text{of Na2S2O3} \times 8 \times 1000}{V2\left(\frac{V1 - v}{V1}\right)}$$

Where

V_1 = Volume of sample bottle

V_2 = Volume of contents titrated

V = Volume of M_nSo_4 and KI added

III. RESULTS AND DISCUSSION

Table.No.2-Obtained results during Jan.2013 to June 2013.

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D.O.(mg/l)	**Jan.13**	**Feb.13**	**Mar.13**	**Apr.13**	**May.13**	**Jun.13**
S1	1.5	1.7	1.8	1.6	1.5	1.4
S2	2.6	2.5	2.7	2.8	3	3.1
S3	3.7	3.9	4.2	4.6	4.9	4.8
S4	1.2	1.6	1.8	1.8	1.6	1.7
S5	4.9	4.7	4.9	5	5.2	5
S6	2.8	2.9	3	3.1	3.2	3.3
S7	3.3	3.4	3.6	3.8	3.9	4

Dissolved Oxygen in groundwater varied from 1.2 to 5.2mg/l. Standards for Dissolved Oxygen has not been set by BIS and WHO. Dissolved Oxygen at all sampling Stations were found below 5 mg/l. [7] Highest D.O. recorded at S5 i.e. Bhendipada area bore well. Lowest D.O. was recorded at station no.S4 i.e. Vadavli area bore well which indicates contamination at sampling sites by anthropogenic activities. Oxygen decreases in water due to decomposition of organic matter, oxygen demanding wastes and inorganic reluctant rise in temperature. [8]

IV. CONCLUSION

Dissolved Oxygen was found lowest at Vadavli area bore well, which indicates highly polluted sampling site by organic matter. almost all sampling sites shows Dissolved Oxygen below 5 mg/lit., which is an indication of pollution at all sampling sites by anthropogenic sources and these sites are not suitable for domestic and other purposes.

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