

Physicochemical Analysis Of Ground Water Of Kondeshwar Lake, Badnera, Dist.Amravati, Maharashtra, India

Dr. Shamal Doifode , Dr. Suresh Rewatkar
Department of Chemistry, Govt College of Engineering, Amravati

Abstract: Ground water sample were collected from 3 various sites of Kondeshwar Lake , Badnera from Amravati district. These water sample were analysed for their physico-chemical characteristics. Laboratory test were preformed for the analysis of samples for pH, hardness, chloride , alkalinity , TDS etc. On comparing the results against drinking water quality standards laid by Indian Council of Medical Research (ICMR). It is found that water samples are potable for human being.

Keywords: Water Quality, Physio-chemical Parameters, Drinking Water.

I. INTRODUCTION

Ground water is the ultimate most suitable fresh water resource with nearly balanced concentration of the salts for human consumption. Drinking water should be free from colour and turbidity.

II. MATERIAL AND METHODS

Kondeshwar Lake: Kondeshwar Lake is a place away from 6 km from Badnera . There is a famous historical temple of Lord Shiva which was constructed many years ago due to which it is also a tourist place. The water from this lake is used for drinking purpose during holy programs near temple.

Selection of site:- water samples were collected from sampling site of Kondeshwar Lake near Badnera city, district Amravati.

Sample collection:- The sample was taken by grab sampling method. The sample collected in a polythene bottle. Few parameters were taken at the spot like temperature and colour.

Physico-chemical analysis is the prime consideration to access the quality of water for its best usage say for drinking, bathing , fishing, industrial processing and so on ,while for waste water either domestic or industrial to know the pollution strength and its effect on ecology

Physical Parameter :- colour, temperature turbidity , conductivity, total solid , total suspended solid , total dissolved solid , pH can be measured.

Chemical Parameter: Dissolved oxygen, total alkalinity, total hardness, calcium hardness, magnesium hardness , acidity can be measure with the help of different methods.

Table for Drinking Water Standards

Sr. No.	Parameter	WHO standards	ISI standards	USPHS standards
1	Temperature	---	---	---
2	pH	7.6	6.0 - 9.0	---
3	Conductivity	---	---	300m mho cm ⁻¹
4	Turbidity	25 NTU	5 - 25 NTU	---
5	Total Solids	500 - 1500 mg/lit	500 - 2000 mg/lit	---
6	Total Dissolved Solids	---	500 - 1000 mg/lit	500 mg/lit
7	Total Suspended Solids	---	100 mg/lit	---
8	Alkalinity	---	200 - 600 mg/lit	---
9	Acidity	---	---	---
10	D.O.	---	4.5 - 6.5 mg/lit	4.0 – 6.0 mg/lit
11	Total Hardness	150 mg/lit	300-600 mg/lit	---
12	Calcium Hardness	200 mg/lit	75-200 mg/lit	---
13	Chloride	600 mg/lit	250-1000 mg/lit	250 mg/lit

III. OBSERVATION AND RESULT

For the analysis of physiochemical parameters of Kondeshwar Lake water was taken . The 3 site wise data is observed and after that analysis is represented in table A , B , C for site-1, site-2 and site-3 respectively.

Physical Parameters:

Temperature : The temperature of all 3 sites of Kondeshwar Lake water was found to be 25^{0c} .

Colour: The colour of all 3 sites of Kondeshwar Lake water was light turbid .

Turbidity: Turbidity was found in the range of 30.9 NTU to 43.3 NTU. The higher turbidity was found at site-3 of Kondeshwar Lake i.e. 43.3 NTU while the lowest turbidity was found at site-1 and site-2 i.e. 30.9 NTU.

pH: the pH was found in range of 7.3 to 7.67 .The pH of site-1 was 7.3, while the pH of site-2 was 7.65 and pH of site-3 was 7.67.

Conductivity: Conductivity was found in the range 0.467 m mho cm⁻¹ to 0.491 m mho cm⁻¹ .

Total Solid: The total solid of site-1 was found to be 12 mg/lit while total solid of site-2 and 3 was same i.e. 800 mg/lit.

Total Suspended Solid: The total suspended solid of site-1 of Kondeshwar Lake water was found 400 mg/lit while site-2 and site-3 was found same 200mg/lit.

Total Dissolved Solid: Total dissolved solid of site-1 of Kondeshwar Lake was found 800 mg/ lit while site-2 and 3 were same 600 mg/lit.

Chemical Parameters:

Dissolved Oxygen: The dissolved oxygen value was found in range between 5.6 mg/lit to 9.6 mg/lit.

Total Alkalinity: The total alkalinity was found in range between 162 mg/lit to 180 mg/lit. The alkalinity of site-1 of Kondeshwar Lake water as found 180 mg/lit while site-2 and-3 was found to be 162 mg/lit and 176 mg/lit respectively.

Total Hardness: The total hardness was found in range between 188 mg/lit to 196 mg/lit. The total hardness of the site-1 is found to be 196 mg/lit while the site-2 and site-3 of Kondeshwar Lake is found to be 188 mg/lit and 196 mg/lit respectively.

Calcium Hardness: The calcium hardness was found in range between 64mg/lit to 88 mg/lit. The calcium hardness of site-1 was found to be 78.4 mg/lit while of site-2 and site-3 was found to be 88 mg/lit and 64 mg/lit respectively.

Magnesium Hardness: The magnesium hardness was found in range between 100 mg/lit to 133 mg/lit. The magnesium hardness of site -1 was found to be 117.6 mg/lit while of site-2 and site-3 was found to be 100 mg/lit And 132 mg/lit.

Acidity: Acidity was found in range between 10 mg/lit to 20 mg/lit. The acidity of site-1 was found to be 20 mg/lit while of site-2 and site-3 was found to be 10 mg/lit and 20 mg/lit respectively.

Chloride: The chloride of Kondeshwar Lake water was found same at all three sites to be 1.196 mg/lit.

Table A: Physicochemical Parameters Of Kondeshwar Lake site- 1

Sr. No.	Parameters	Site-1
1	Temperature	25 ^{0c}
2	Colour	Light turbid
3	Turbidity	30.9 NTU
4	pH	7.30
5	Conductivity	0.476 m mho cm ⁻¹
6	Total solid	1200 mg/lit
7	Total Suspended Solid	400 mg/lit
8	Total Dissolved Solid	800 mg/lit
9	Dissolved Oxygen	5.6 mg/lit
10	Total Alkalinity	180 mg/lit
11	Total Hardness	196 mg/lit
12	Calcium Hardness	78.4 mg/lit
13	Magnesium Hardness	117.6 mg/lit
14	Acidity	20 mg/lit
15	Chloride	31.196 mg/lit

Table B:- Physicochemical Parameters Of Kondeshwar Lake site- 2

Sr. No.	Parameters	Site-2
1	Temperature	25 ^{0c}
2	Colour	Light turbid

3	Turbidity	30.9 NTU
4	pH	7.65
5	Conductivity	0.491 m mho cm ⁻¹
6	Total solid	800mg/lit
7	Total Suspended Solid	200 mg/lit
8	Total Dissolved Solid	600 mg/lit
9	Dissolved Oxygen	9.6mg/lit
10	Total Alkalinity	162 mg/lit
11	Total Hardness	188 mg/lit
12	Calcium Hardness	88 mg/lit
13	Magnesium Hardness	100 mg/lit
14	Acidity	10 mg/lit
15	Chloride	31.196 mg/lit

Table C:- Physicochemical Parameters Of Kondeshwar Lake site- 3

Sr. No.	Parameters	Site-3
1	Temperature	25 ^{0c}
2	Colour	Light turbid
3	Turbidity	43.3 NTU
4	pH	7.67
5	Conductivity	0.488 m mho cm ⁻¹
6	Total solid	800 mg/lit
7	Total Suspended Solid	200 mg/lit
8	Total Dissolved Solid	600 mg/lit
9	Dissolved Oxygen	8.8 mg/lit
10	Total Alkalinity	176 mg/lit
11	Total Hardness	196 mg/lit
12	Calcium Hardness	64 mg/lit
13	Magnesium Hardness	132 mg/lit
14	Acidity	20 mg/lit
15	Chloride	31.196 mg/lit

IV. DISCUSSION AND CONCLUSION

Temperature is useful for biological activities .it is enhance by higher temperature. The temperature of Kondeshwar Lake water of all 3 sites is same due to specific environmental conditions.

The colour of water for all 3 sites is light turbid due to low level of water. The turbidity of lake water found at all 3 sites is more than permissible limit.

H⁺ concentration expresses the intensity of the acidity and alkalinity of the water. It plays limiting role in the growth of flora and fauna of aquatic body. pH plays great importance because chemical and biochemical reactions in aquatic body takes place at particular pH.

pH of all three sites of Kondeshwar Lake is neutral i.e. permissible range for drinking water. Conductivity of Kondeshwar Lake water was near about same due to total solids. It must have the cause for the electric conductivity.

Total solids of site-1 was higher than site-2 due to human disturbances but it was under permissible level of standards given by WHO for drinking water.

Total suspended solid was higher at site-1 than site-2 and site-3 of Kondeshwar Lake water.

Total dissolved solids of 1st site was found higher than other two sites.

Dissolved oxygen was found to be higher at 2nd site than other two.

Total alkalinity of water is found more at 1st site than two others.

The Ca and Mg salts largely combines with carbonates, sulphates, chlorides content are responsible for hardness of water. The surface water is less hard than ground water.

Total hardness was found more at 3rd site while that of other two was also more than the permissible limit.

The calcium hardness of 2nd site was higher than the other two but all the three readings under permissible limit.

Magnesium hardness was found to be more at 3rd site than 1st and 2nd site.

Acidity at 1st and 3rd sites was similar and higher than 2nd site.

Chloride of all 3 sites was similar and less chloride of water indicate the purity of water.

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