

# An Examination and Evaluation of Water Quality Parameters in The Akola District Region of Maharashtra

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## ABSTRACT

The collection of groundwater samples took place from 16 March to 16 July 2021 at various sampling locations within a 30-kilometer radius of the Akola district. A total of twenty water samples underwent physical and chemical analysis in the laboratory. The laboratory conducted various analyses, including pH, EC, BOD, hardness, alkalinity, chlorides, TDS, and DO. Every outcome was assessed in relation to the potable water quality standards established by the World Health Organization (WHO) and the ISI Standard. Compared results indicate that a number of water samples fail to meet one or more of the aforementioned standards for the quality of potable water. Numerous samples contained extremely contaminated TDS. The discussion centered on the significance, utility, and inefficacy of these parameters in forecasting the characteristics of surface water quality in groundwater.

**Keywords :** EC, BOD, TDS, Chloride, alkalinity

## I. INTRODUCTION

Water is an odorless, transparent, tasteless, and colorless inorganic chemical. There are numerous natural conditions of water. Precipitation manifests as rain, while aerosols manifest as smog. Dispersed particles of water constitute clouds. Water in its gaseous state exists as steam or water vapor. Regions vary in the purity of their water supplies. This is due to the fact that chemical constituents and constituent concentrations vary from region to region. Water of compromised quality results from contamination. That is, it is unfit for human consumption. The introduction of foreign substances, such as microorganisms, chemicals, industrial waste, or effluent, results in a decline in quality. Constant

seasonal variation exists in water quality. Regular monitoring is crucial in order to control any spatial or transient variation[1-3].

## II. EXPERIMENTAL

The collection of water samples occurred between 16 March and 16 July 2021. Each of the twenty sources of samples collected in glass vessels in accordance with the standard was located in the Akola district. Transporting and presenting water samples to the laboratory in accordance with established procedures. The receptacles designated for the scientific investigation of the potability and other domestic uses of surface water and groundwater. On location, the temperature of the water was determined utilizing a mercury thermometer. Utilizing a potentiometer to

quantify oxidation-reduction force. A conductometer measures conductance. The pH is determined using a pH meter. The samples utilized were distilled water and A.R. grade. Tables 1 and 2 detail the parameters and methodology utilized to analyze the samples.

The hardness exhibited regional variation. The range was 593.6 ppm to 200 ppm. The presence of magnesium carbonate, calcium carbonate, and bicarbonates contributes to the hardness. A region exhibited elevated hardness due to its high concentrations of both calcium and magnesium. Elevated rates of decomposition and evaporation result in corresponding increases in magnesium and calcium concentrations[4-5].

The term "dissolved solids" or "total dissolved solids" (TDS) refers to the dissolved minerals that are present in water. In different regions, the TDS spectrum was diverse. The TDS varied between 450 and 566.6 mg/L. This may encompass organic substances in the case of

contaminated water and industrial refuse. Moreover, it influences the overall dissolved burden. Chloride concentrations varied between regions. Sodium and chloride ions produce salt crystals due to their attraction during high evaporation[6].

### III. RESULTS AND DISCUSSION

The table contains the outcomes of physical and chemical parameters. Each sample was devoid of odour and colour. The water samples exhibited pH values ranging from 7.46 to 8.16. The majority of the water samples exhibited an alkaline pH. The concentration of D.O. in water samples ranged between 5.37 and 6.35 mg/L. The water samples contain magnesium and calcium concentrations that vary between 95 and 229.3 mg/L and 45.26 and 138.9 mg/L, respectively[7-8].

Table 1

Parameters	Method	Standard values (WHO 1993)	ISI 1991
Colour	colorimeter		-
Odour	By smelling		-
Temperature	Thermometer	100°C	-
pH	pH meter	7.5 to 8.5	6.5 to 8.5
D.O.	Winkler method	< 5.0 mg/L	< 5.0
Alkalinity	Titrimetric	-	-
Chlorides	Titrimetric	250 mg/L	250
TDS	-	500 mg/L	500
Total hardness (as CaCO <sub>3</sub> )	Titrimetric	100 mg/L	300
Total magnesium	Titrimetric	150 mg/L	30
Total Calcium	Titrimetric	100 mg/L	75 mg/L
BOD	Titrimetric	Not more than 8 mg	-
COD	Titrimetric	Not more than 250 mg/L	-
ORP	Potentiometer	-	-

Table 2

Sr.No	Location	pH	Conductance(̳)	ORP (mv)	TDS (mg/L)	DO (mg/L)	Chlorides (mg/L)	TH (ppm)	Mg (mg/L)	Ca (mg/L)	BOD (mg/L)	COD (mg/L)
1	Umari	8.08	525.6	50.6	563.3	5.93	213.6	585.3	160	138.9	2.16	16.8
2	Adsul	8.16	567.6	56.3	500	6.1	249.2	593.3	144	138.26	1.81	16.6
3	Panchgavan	7.86	535.6	45.6	550	6.29	231.4	517.3	177.3	136.04	1.98	18.2
4	Telhara	7.82	548.6	54.6	566.6	6.09	209.8	593.6	95	124.5	1.80	18
5	Gordha	7.95	527.3	53	486.3	6.35	192.3	536	112	101.3	2.06	16.8

6	Devri	7.83	530.3	60.6	550	5.76	218.2	464	149.3	86.93	2.0	20
7	Mundgaon	8.01	500.6	59	516.5	5.37	154.3	486	103.3	122.47	2.0	21.8
8	G Nursery	7.45	485	65	550	6.09	167	449.4	148	125.19	2.68	22.1
9	Pote Vidyalaya	7.8	518.3	58	516.6	6.02	131.6	494.6	149.3	122.47	1.89	20
10	Mahindra Showroom	7.66	517.6	51	600	6.29	101.9	441.3	145.3	126.95	2.16	21.5
11	Washimba	7.98	495.3	62.3	450	6.15	75.9	364	272	47.18	2.17	21.7
12	Vani	7.88	521	53.6	533.3	6.32	93.5	292	105.3	45.26	2.39	21.4
13	Pailpada	7.46	575	52.3	516.6	6.02	82.6	401.6	225.3	58.31	2.09	21.6
14	Katepurna	7.86	516	54	566.5	5.76	88.3	455.1	214.6	59.37	2.00	20.1
15	Kolambi	7.86	294.6	56.3	550	5.89	100.3	200	229.3	52.3	2.29	21.2
16	Akot Fail	7.91	497	60.3	466.6	5.83	103.9	257.3	133	66.6	2.29	20.4
17	Tapdiya Nagar	8.03	574	65	506.6	6.15	111.3	515	110	63.1	2.30	20.2
18	Umari Akola	8.13	360	50.3	550	5.83	105.5	421.3	133.3	55.5	2.28	20.2
19	Jatharpeth	7.86	497	53.3	516.1	6.06	125.6	521	128	53.1	2.33	22.6

#### IV. CONCLUSION

We have prepared new 1, 3-oxazine derivatives containing benzyloxyhydroxymonoiodo raceacetophenone moiety in their structured excepting enhanced bioactivity. None of the compounds have shown good antimicrobial activity compared to standard drugs.

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