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**Physico Chemical Studies on Ground water in Jafrabad Tehsil, Jalna District,  
Maharashtra**

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**Abstract :**

The water and environment has become an emotive issue with the people and policy makers, the paper presents Physico-chemical studies of the ground water. In Jafrabad Tehsil Dist. Jalna. The water quality parameters. Viz, pH, electrical conductivity (EC), Turbidity, total dissolve salts (TDS), Sodium (Na), Potassium (k), Calcium (Ca), Chlorites (Cl), Sulphate ( $\text{SO}_4^{-2}$ ), Fluoride (F), Total hardness (TH), Dissolved oxygen (DO) were analyzed. The results shows that the ground water from some sampling sites is within permissible limit according BIS

**Keywords** – Ground water, Quality of water, BIS.

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**Introduction**

Water is vital for existence for all life forms and is essential for all activities of human beings. Drinking water plays an important role in the bodily intake of true element by human. Even though some trace elements are essential to man at elevated levels. Essential as well as non-essential elements can cause. Morphological abnormalities reduce growth increase mortality and mutagenic effects. In this present study water samples were collected from hand pumps of different areas in Jafrabad Tehsil, Dist. Jalna. The various physical and chemical parameters were determined and the result were compared with the values of Bureau of Indian Standard (BIS). The main aim of the study was to report on the trace elements. Present in the drinking water sources marked for this study.



## Experimental Section

Study Area: Jafrabad Tehsil is a Tehsil in Jalna District. It is connected to Jalna and Aurangabad by state highway. The maximum peoples of this area are depend upon the ground water for drinking purpose. Average temp. of this place varies from 42°C to 29 °C in summer. Total 10 samples from different places in a random manner. This samples was collected in polythene bottle. The analysis of water was done using procedure of standard methods.

Sr.No.	Sampling Place	Sr. No.	Sampling Place
1	Svangi	6	Tembhurni
2	Nalvihira	7	Kumbharzari
3	Papal	8	Dahegaon
4	Haratkhedha	9	Delegavan
5	Aland	10	SavargaonMhaske

## Result and Discussion

Parameters/ Sample No.	1	2	3	4	5	6	7	8	9	10
Colour	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Temp (°C)	26	25	24	24	25	25	25	24	25	25
pH	7.30	6.98	7.08	7.22	6.94	7.12	7.05	7.10	7.02	7.00
Turbidity (NTU)	1.00	1.70	1.50	1.21	1.17	1.24	1.81	1.00	1.70	1.10
Conductivity (µs /cm)	550	740	880	900	674	1100	790	760	580	650
TDS (ppm)	480	340	260	386	250	345	445	200	310	290
Total alkalinity (ppm)	160	92	110	145	195	100	91	121	110	190
Ca (ppm)	65	50	21	32	55	41	45	30	20	49
Mg (ppm)	10	22	12	14.8	25	19	21	12	27	20



Total hardness (ppm)	255	210	180	170	190	210	220	112	252	190
Na (ppm)	6.50	8.50	7.50	6.12	5.21	7.12	8.00	9.00	9.12	12.10
K (ppm)	2.50	3.18	2.25	3.15	1.95	2.00	1.90	2.21	2.00	1.86
DO (ppm)	5.80	6.10	5.40	5.60	6.12	5.95	5.75	5.50	6.00	5.23
SO <sub>4</sub> <sup>-2</sup> (ppm)	30	35.50	49.52	40.21	65.11	20.00	40.00	50.50	45.00	41.00
Cl (ppm)	40.36	45.18	85.57	91.12	180.25	110.2	44.11	73.12	95.11	160.10
F (ppm)	0.11	0.10	0.00	0.03	0.05	0.02	0.00	0.00	0.00	0.00

The various physical and chemical parameters determined for the water samples were given in table. From the analyzed results. It was found that the quality of water considerably varies from location to location. As far as the physical parameters are concerned all the samples were appeared as colourless.

pH varies from 6.94 to 7.30. This shows that all samples are existed within the minimum and maximum tolerable limits of BIS.

The turbidity level of all samples are lower than the permissible limits as standard value of BIS. Total dissolved solids (TDS) are the concentration of all dissolve minerals in water indicateds. The general nature of salinity of water. The values of total dissolved solids. (TDS) determined for all samples showed minimum tolerance limit of 500 ppm. TDS values varies from 200 to 480 ppm to collected samples of study area. The higher value of total dissolved solids is to application of situation of rocks, higher values of TDS in ground water are not harmful to human being.

Alkalinity is the measure of the water to neutralize a strong acid. The alkalinity in the water is generally imported by the salts of carbonates etc. In the study area all the samples are in permissible limits of 200 (ppm). Total alkalinity varies from 91 to 195 mg/l high alkalinity in water bodies leads to sour taste and salinity. Conductivity is measure of capacity of substance to conduct the electric current most of. The salts in water are presents in their ionic forms and



capable of conducting current and conductivity. Electrical conductivity is an indication of the concentration of total dissolved solids and major ions in a given water body.

In the present study the conductivity varies from 550 to 1100  $\mu\text{s}/\text{cm}$  where the permissible limit is 750 to 2250 all samples are in limit as per the BIS.

Most of ground water is dominated by calcium and bicarbonates ions due to the weathering of limestone's in the rain catchments and ground water beds. Total hardness is considered as the major character of drinking water. Hardness is defined as the concentration of calcium and magnesium ions.

Chlorine in water is in the form of chloride ion it is one of the inorganic ion present in ground water not harmful but come more than 250 ppm gives chlorine taste to water.

Increase in the sulphate causes gastritis. All the samples are below the 200 ppm as per BIS. Sodium is present in most ground water for negligible to appreciable come. Increasing concentration of Na causes cardiac and circulatory disease.

Dissolved oxygen of water samples collected lies in the range 5.23 to 6.10 mg/l samples.

Turbidity in the water is due to colloidal extremely fine dispersion clay particles, organic and inorganic particles, microscopic organism in the water. The turbidity in the samples varies from 1.00 to 1.81 ppm and it is below the limit of BIS.

### **Conclusion :**

The ground water samples collected from the various places in Jafrabad city were analysed for various physico-chemical parameters. According to this study all of ground water in study area pH, EC, turbidity, total hardness, TDS are in tolerance limit as per BIS.

### **References:**

- [1] BIS, Specification for drinking water, Bureau of Indian standard, New Delhi 1998, 171-178.
- [2] UNESCO, Groundwater UNESCO Environmental and development briefs no 2, 1992, 14P.
- [3] ISI, 1966 Methods for sampling part 1 (6) IS 2488
- [4] WHO, World Health Organization, International Standard for drinking water, Geneva, Switzerland, 1992



[5] Dhar B.B.; S.Ratan; A.JamalJ.Mines, Metals and Fuels 1986,596.

[6] Mitra Das and G.S. Rana , Journal of Chemical and PharmacetucalReaserch, 2012,  
4(8);3803-3807.