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PHYSICOCHEMICAL PARAMETERS OF WATER SAMPLES IN ETAPALLI CITY OF GADCHIROLI DISTRICT OF MAHARASHTRA.

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Abstract : The present study is focused on the physicochemical parameters such as Temperature, pH, Turbidity, Total Dissolved Solids and Conductivity of water in Etapalli Dist. Gadchiroli from different sampling points. The peoples use water from this point for drinking purpose and for daily needs. The sampling is taken from different places, so that all places are to be covered. All the samples of water are taken from borewell.

IndexTerms - Temperature, pH, Turbidity, Total Dissolved Solids and Conductivity.

I. INTRODUCTION

The temperature of water is varying with location, and sampling time. (Abhipathy et.al. 2006) (Adebowale et.al.2008). The pH value for any sample is the reciprocal of activity of hydrogen ion per liter. (Spellman. 2017) and (Edzwald. 2010). The range of pH for water is from 1 to 14. It means the water with pH below 7 are considered as acidic while above 7 considered as basic. But overall pH range for natural water is between 6 to 8. (WHO. 2011). The P^H value is measured by two methods. One is by using electrometric method, which gives accurate results but it is expensive. Another one is calorimetric method which also gives accurate results and it is less expensive but has some drawbacks of color, oxidants, turbidity presents in water sample (APHA. 2005). Water is main content require for all living things and it is colourless, odourless (Gregory, et. al., 2012). Water shows many properties due to the presence of H+ ion and OH- ions. (Body-Clenz. 2013). The scale on which pH of any solution is given by international agreements (Myers, 2012). The pH scale is important in the various field like Agriculture, Medicine, Research and Development, Nutrition, Food Science, etc. (Beckman, 1993). The best way to calculate pH of any solvent there are two methods i.e. pH meter and indicator method (Bates. 2000).

The results obtained for turbidity is due to the scattering of light by sample from incident light. (Alley. 2010) For calculation of turbidity the turbidity meter is used. This instrument consists of a light source which produce beam of light that passes through a sample and there is photo electric detector which shows the reading between intensity of incident light and scattered light. (APHA. 2005) The water sample from borewell shows very low turbidity due to natural filtration occurs. (Viessman, et.al. 2004) Drinking water is obtained from natural sources like surface of earth and underground of earth. The surface water from river, pound, Lake Etc. may be polluted by some particle or chemical while underground water is contaminated with soil and water contain particle. Thus the degradation of soil content in water results coagulation, some microorganisms, clay particle are responsible to produce turbid nature of water (Holt. 2000). Turbidity treatment is important factor to remove coagulation, removal of unwanted material from water (Michael.1982). The heavy concentration of nitrate in the sky is responsible for acid rain (Nebbaches. 2001). If turbidity value is higher than 5 NTU in corporation water supply then corrosion of taps, pipelines and blockage of pipe occurs (Betancourt, et.al. 2000). Turbidity has major impact on distribution system (Vincent Gauthier, et.al. 2003).

The calculation of TDS is nothing but the calculation of inorganic salts presents in the water sample. (SnekaLata, et. al. 2015). The water which contain very low concentration of Total Dissolved Solids is also effective for drinking. (Bruvold, et.al. 1969). When the pollutants, clay particle mix with water is contaminated, so that the TDS parameter can be check regularly and if it is out of range then take immediate action (www.safewater.org) The total solids can be measured by using evaporating method and Total Dissolved Solids TDS meter. In the evaporating method there is requirement of drying oven, analytical balance, evaporating dish, desiccator, vacuum pump and crucible, means this method take long time.

The conductivity of any solution is due to the presence of ions in that solution. (Huq. Et. Al. 2005) Normally the pure water is neutral hence it has no conductivity. But the ultrapure water has 5.5 $\times 10^{-6}$ S/m, drinking water has 0.005 – 0.05 S/m and sea water has 5 S/m (Alley. 2010) and (APHA. 2005). Conductivity of water is the property which gives information about any dissolved ions. (Bhatnagar, et.al. 2013). Also, it is used to determine the pure water, drinking water. (Golnabi, et.al. 2009). At different concentration of NaCl and at different temperature the conductivity of the solvent is different (Shrestha, et.al. 2017). Conductivity is used to determine whether ions presents in pure water, drinking water. (Golnabi, et.al. 2009). At different concentration of NaCl and at different temperature the conductivity of the solvent is different (Shrestha, et.al. 2017).

II. MATERIAL AND METHODS:

All the samples are collected from selected points in bottles and take in laboratory for further analysis. Some people are using this water for drinking purpose. All these location are far from eachother.

2.1 Temperature: Temperature is measured by using thermometer directly deep into water sample, after some time note down the reading.

2.2 pH: The P^H Meter Model AMPH-01 which works according to electrometric method is used. Firstly, the pH meter is standardized by using buffer solution of sample and another buffer solution having different pH.

2.3 Turbidity: The calibration of Digital Turbidity Meter is according to the operating instruction. Take sample in sample tube and kept in turbidimeter. Take care there is no air bubble in sample tube.

2.4 Total Dissolved Solids: Another one is TDS meter Model AM-TDS-01 which shows directly reading when it deep in water sample. Take the sample of water and deep the TDS meter upto the mark.

2.5 Conductivity: Generally the conductivity is measured by electrometric method. We use the pen like Conductometer Model AM-COND-01 which deep in water sample shows directly reading.

III. RESULTS AND DISCUSSION

3.1 The parameters given by various Standards are as.

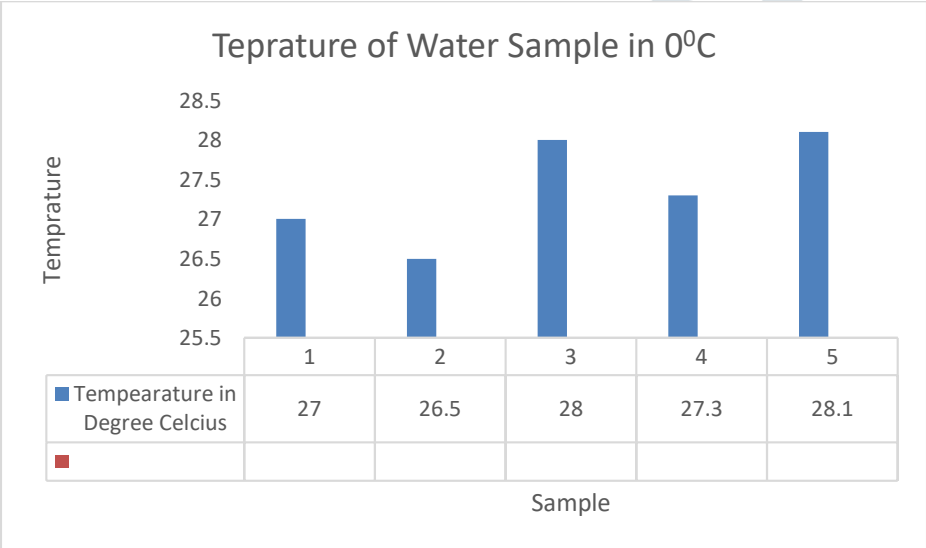
Table 3.1: Standards by ISI and WHO

Sr. No.	Parameters	Standards by ISI	Standards by WHO
1	Temperature	-----	-----
2	pH	6.5-8.5	6.5-9.5
3	Turbidity	5 NTU	5 NTU
4	Total Dissolved Solids	500 ppm	300 ppm
5	Conductivity	500-1000 µg/cm	1400 µg/cm

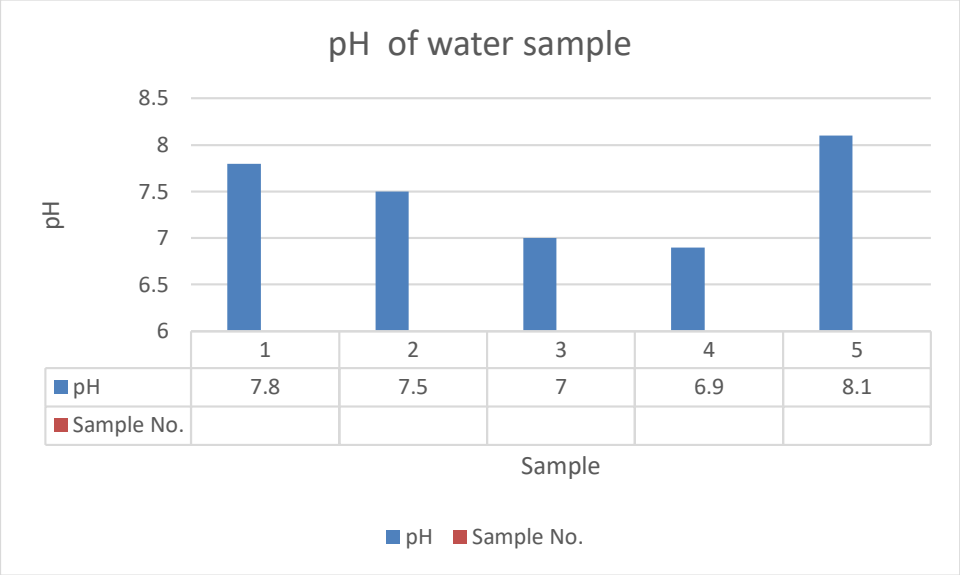
The analysis results for all the parameters are as follows**.**

3.2 Temperature:

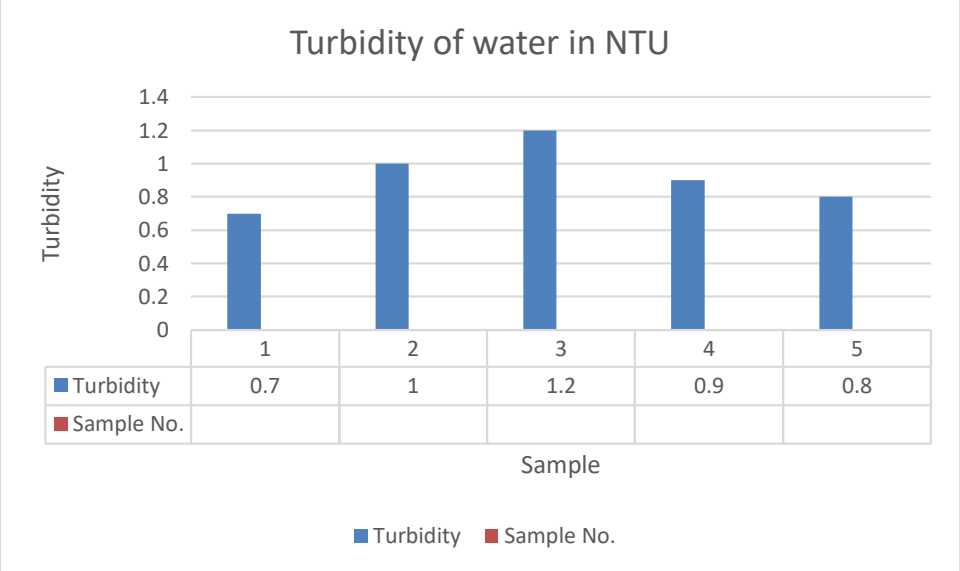
The temperature for all sampling point is found between the range 27 0^0C to 28.10^{0}C. All the samples are from different region.



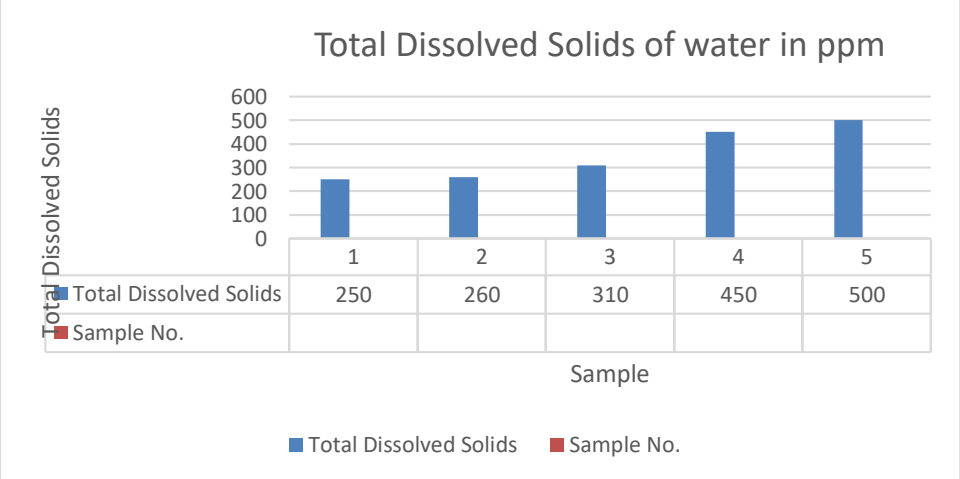
3.3 pH: The pH of given sample are measured by using P^H Meter Model AMPH-01. Theis meter shows reading directly when deeped in water samples. Results shows the pH value in the required range of Standard given by WHO and ISI. The sample no. 3 shows minimum reading 7.0 while sample no. 5 shows maximum reading 8.1



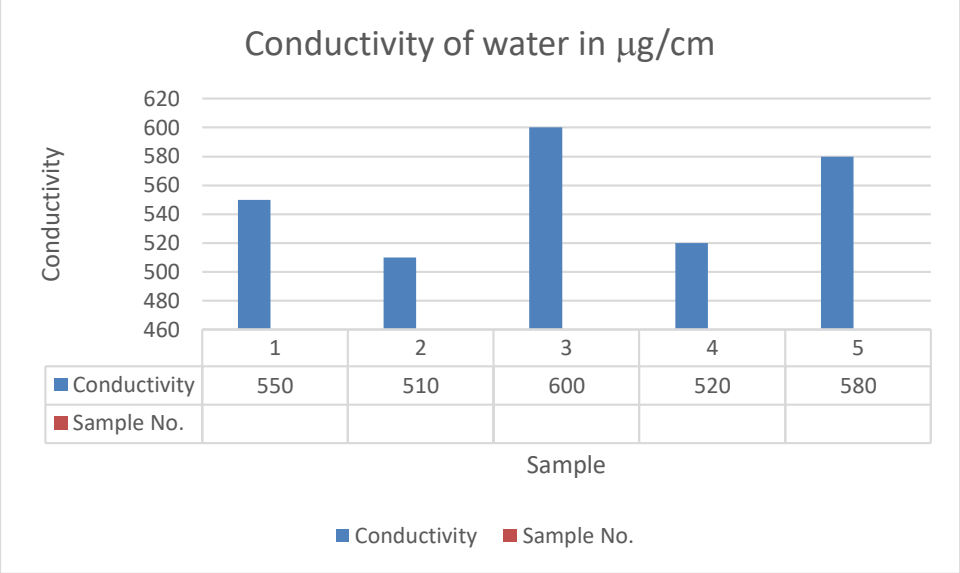
3.4 Turbidity: The turbidity of water samples is between the range of ISI and WHO standards. The turbidity found in water is more if it contains more amount of soil sedimentation (WHO 1996). The present results are found between 0.7 to 1.2 NTU.



3.5 Total Dissolved Solids: The Total Dissolved Solids in water sample can be analysed by using TDS meter Model AM-TDS-01. Results are obtained between the range 250 to 500 ppm. The TDS value is minimum for sample no.1 and maximum for sample no. 5. All the results follows ISI Standard but sample no.3, 4, and 5 vary WHO Standards.



3.6 Conductivity: The conductivity of water sample is analysed by using pen type Conductometer Model AM-COND-01, it shows directly reading when deep in water sample. The results obtained are in the range 510 to 600 µg/cm.



IV. CONCLUSIONS:

The results obtained from analysis of water sample are within the ISI and WHO Standards. The temperature ranges from 27 0^0C to 28.10^0C, pH range from 7 to 8.1, Turbidity range from 0.7 to 1.2 NTU, Total Dissolved Solid range from 250 to 500 ppm and Conductivity ranges from 510 to 600 µg/cm.

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