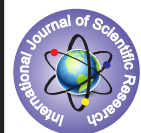


Physico- chemical analysis of water sample of Mehasana urban and rural area Gujarat



Chemistry

KEYWORDS: Physico-chemical analysis, parameters, WHO, permissible, Mehsana.

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ABSTRACT

The water sample quality is determined in urban area and rural area of Mahesana city located in Gujarat, India. In this study the water samples were taken from different areas and, In this water samples, Physico chemical analysis of various types of parameters are measured such as, pH, Electrical conductivity(EC), Total dissolved solids (TDS), Total hardness (TH), physico chemical properties anion and cation and it is compared with World Health organisation(WHO) standard of water quality. in all the water sample the pH value was found almost neutral. Total dissolved solids and Total hardness of water sample increased towards water of rural to water of urban. In this research work it is found that almost all the parameters were within permissible limits of drinking water and the purpose of present study is to check the quality of drinking water. Result and discussion given as under.

Introduction:

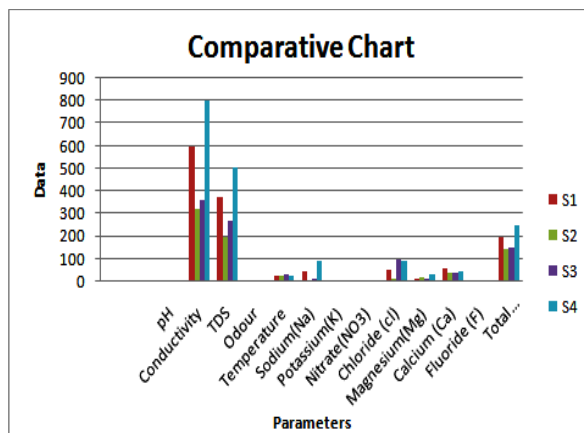
It is said that water is the life. water is one of the most essential require of all living beings. The basic survival need for human life is oxygen, water and food. Water plays most important role in all living beings. Man can survive so many days without food but can't live any more without water. The Fresh water is one of the most important resources for survival of all the living being. Ground water plays a vital role in human life. urbanization and industrialization leads to spoil the water. It is observed that from the last ten years ground water get polluted drastically because of human activity and so that the number of diseases arises which cause the health hazard. there for it is necessary to know the chemistry of water for human health. Pure and good quality of water is directly connected with the health, development and happy human life.

Materials and methods:

The water samples were collected from different rural and urban area in the morning during 8 am to 11 am in the polythene bottles and then the water sample were immediately brought in to the laboratory for the analysis of various types of physical chemical properties like pH, TDS, EC, water temperature and other parameters. The pH of the water sample were recorded with digital pH meter, TDS value were measured by TDS meter while others parameters such as hardness Na^+ , K^+ by flame photometers Cl^- , Ca^{+2} , Mg^{+2} , NO_3^- , F^- were estimated in the lab by using standard titration methods. The present study shows the analysis of drinking water quality in the terms of physico chemical method.

Table:- Physico Chemical properties (mg/lit) of water sample Mehsana Rural and Urban area with reference to World Health Organisation (WHO) standard given in following Table.

Physico-Chemical properties (mg/lit)	WHO	S ₁	S ₂	S ₃	S ₄
pH	6.5 to 8.5	7.4	7.5	7.6	7.5
Conductivity	-	600	320	360	800
TDS	500	372	198	269	509
Odour	-	0	0	0	0
Temperature	-	29	29	30	29
Sodium(Na)	130	45.6	9.4	13.9	90.5
Potassium(K)	100	1.9	1.6	2.1	2.5
Nitrate(NO ₃)	45	1.7	0.98	1.5	3.1
Chloride (cl)	200	51.2	13.7	99.7	91.5
Magnesium(Mg)	150	11.9	16.6	10.8	31.5
Calcium (Ca)	100	59	39	41.6	47.5
Fluoride (F)	-	0.3	0.1	0.2	0.3
Total hardness(TH)	200	197.2	146.3	148.4	248



Result and Discussion:

The Physico chemical parameter and chemical properties is presented in the above table

Sample:1 Para Talab area Mehsana rural.

Sample:2 Ramosana area Mehsana rural.

Sample:3 New bus stand area Mehsana urban.

Sample:4 Toranvala mataji area Mehsana urban.

During the observation there was no any signification change in the pH value and the pH value range was found in 7.0 to 7.6, Total hardness, and Total Dissolved solids were in increased order from rural area to urban area. and the concentration of nutrient like Cl^- & K^+ , Mg^{2+} were slightly different from rural area to urban area but it was in the permissible limit for sample 1 to sample 4. the physico chemical analysis of water sample of different area in the study suggested that there was not any significance change in the parameters.

Conclusion:

On the basis of the physico chemical analysis data of the water sample it is found that the mineral such as Ca, Mg and Na were present below level than the recommended WHO standard. but it was in permissible limits. on comparing the chloride level it was found more urban area than rural area. And was in permissible limit. physico chemical parameter of water sample was compared with standard desirable limit prescribed by WHO. From the study it can be concluded that urban and rural area of Mehsana the water is safe for drinking purpose from the above parameter like pH, Ca, Mg, Na, K, Cl, NO_3^- , F but urban area in sample 4 the TDS level and total hardness was found slightly in increased level. finally all the water samples most of all the parameters were in permissible limits on the basis of tasted physico chemical parameter. and were within the prescribed limit of drinking water as per BIS & WHO it means water is fit for drinking purpose and human consumption.

Reference:

1. Bharambe, P. A., Rodge, R. P. & Ambegaonkar, P. R. (1992). Depth and quality of underground waters as affected by canal irrigation. *Journal of the Indian Society of Soil Science*, 40, 344-347. Akoto O. and Adiyiah, J., (2007), "Chemical analysis of drinking water from some communities in the BrongAhafo region", *International Journal of Environmental Science and Technology*, 4(2), pp 2112-214.
2. Abdul Jarneel, A., (1998). Physico-chemical studies in Uyyoakondan channel water of river Cauvery. *Poll Res.* 17(2), 11-14.
3. Akpoveta O.V., Okoh, B.E., Osakwe, S.A., (2011), "Quality assessment of borehole water used in the vicinities of Benin, Edo State and Agbor, Delta State of Nigeria", *Current Research in Chemistry*, 3, pp 6269.
4. APHA (2005). Standard methods for the examination of water and waste water. 21st ed. Amer. Pub. Health Assoc. Inc. Washington D.C.
5. APHA, AWWA, WPCF, (2003), "Standard Methods for Examination of Water and Wastewater", 19th Edition, American Public Health Association, Washington, DC.
6. Boominathan, R. and Khan, S.M., (1994), "Effect of distillery effluents on pH, dissolved oxygen and phosphate content in Uyyakundam channel water", *Environmental Ecology*, 12 (4), pp 850-853.
7. Prasad, D. S., Rajendra, C., & Sadashivaiah, R. (2011). A Comparative Study of Techniques for Prediction of Water Quality Parameters. *International Journal of Earth Sciences and Engineering*, 04(06), 423-428.
8. Acharya, G. D., Hathi M. V., Patel, A. D., & Paramar, K. C. (2008). Chemical properties of Groundwater in Bhiloda Taluka Region, North Gujarat, India. *E-Journal of Chemistry*, 5(4), 792-796.
9. Salve, V. B. and Hiware C. J. (2008); Study on water quality of Wanparakalpa reservoir Nagpur, Near ParliVajinath, District Beed. Marathwada region, J. Aqua. Biol., 21(2): 113-117.
10. Trivedy, R. K. and Goel P. K. (1986); Chemical and biological methods for water pollution studies, Environmental Publication, Karad, Maharashtra Kaushik.
11. Ramakrishnaiah, C. R., Sadashivaiah, C. & Ranganna, G. (2009). Assessment of Water Quality Index for the Groundwater in Tumkur Taluk, Karnataka State, India. *E-Journal of Chemistry*, 6(2), 523-530.
12. Chauhan, M. L., Vyas, N. N., Pandya, R. N., Patel V. R., & Vohrab, Nikhat. (2012). Physico-chemical studies on bore wells water of Godhra Taluka territory (Gujarat) *Archives of Applied Science Research*, 4(1), 426-432.
13. WHO, (2006). "Guidelines for drinking water quality" Geneva, Report No: WHO/SDE/WSH06.07.
14. Kumar, A. K., Kanchan, Taruna, Sharma, H. R., (2002), "Water quality index and suitability assessment of urban ground water of Hisar and Panipat in Haryana", *Journal of Environmental Biology*, 23, pp 325-333.
15. Khaiwal, R. and Garg, V. K., (2006). "Distribution of fluoride in groundwater and its suitability assessment for drinking purposes", *International Journal of Environmental Health Research*, 16, pp 163-166.
16. Kumar R., Singh, R. D., Sharma, K. D., (2005), "Water Resources of India", *Current Science*, 89(5), pp 794-811.
17. Khan, M. A. G. and Choudhary S. H. (1994): Physical and chemical limnology of lake Kaptai, Bangladesh. *Trop. Eco.* 35(1): 35-51.