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ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS AT RATOLI VILLAGE.

Chemistry

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ABSTRACT

Water scarcity involves water stress, water shortage or deficits, and water crisis. This may be due to both natural and human factors. But, many reports suggest that the scarcity is more due to the human factor than anything – such as industrialization, irrigation, domestic use, etc. Unsafe drinking water is one of the main concerns in developing countries. Water supplies were sampled throughout the villages of this area mostly from boreholes, open wells, rivers and lakes as well as some piped waters. The samples were analyzed for their physical-chemical parameters and quality in order to identify the contamination problems and suggest appropriate solutions. Results of the assessment confirmed that in the studied area there are several parameters of health and aesthetic concern.

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance, generally achieved through treatment of the water, can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact, and drinking water. Generally we have survey of drinking water of some selected areas in Ratoli village having the **population approximately 3500** and the chief sources of water supply are the Hand pumps, Bore wells, Wells, Ponds, Dam and River etc. The following parameters applied for monitoring of drinking water qualities for practical and study proposes. We are using some analytical parameter such as Temperature, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Alkalinity, Hardness and Fluoride quantity in Drinking Water.

KEYWORDS

Water, Physico - chemical, Parameters, Water Samples.

Introduction:-

Water is life and no life can exist without water. So it playas an essential role in human life .The world health organization (WHO)report that 36% urban and 65% of ruler Indian were without access to drinking safe water, 97% of the water on the Earth is salt water and only 3% is fresh water; slightly over two thirds of this is frozen in glaciers and polar ice caps. The remaining unfrozen fresh water is found mainly as groundwater, with only a small fraction present above ground or in the air. Fresh water is a renewable resource, yet the world's supply of groundwater is steadily decreasing, with depletion occurring most prominently in Asia, South America and North America, although it is still unclear how much natural renewal balances this usage, and whether ecosystems are threatened. The framework for allocating water resources to water users (where such a framework exists) is known as water rights. Groundwater is fresh water located in the subsurface pore space of soil and rocks. It is also water that is flowing within aquifers below the water table. Sometimes it is useful to make a distinction between groundwater that is closely associated with surface water and deep groundwater in an aquifer (sometimes called "fossil water").People on globe are under tremendous threat due to undesired changes in the physical, chemical and biological characteristics of air, water and soil. Due to increased human population, industrialization, use of fertilizers and man-made activity water is highly polluted with different harmful contaminants. Natural water contaminates due to weathering of rocks and leaching of soils, mining processing etc. It is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. The availability of good quality water is an indispensable feature for preventing diseases.

Inadequate water supply is still one of the major challenges in developing countries. The Joint Monitoring Programme (JMP) for Water Supply and Sanitation, implemented by the World Health Organisation (WHO) and UNICEF, reports that 783 million people in the world (11% of the total population) have no access to safe water, 84% of whom live in rural areas. About 187 million people use surface water for drinking purposes; 94% of them are rural inhabitants and they are concentrated in sub-Saharan Africa. At a national level, in Chad and Cameroon, it is estimated that 49% and 23% of the population has no access to improved water sources respectively. Consequently, water borne diseases such as cholera and typhoid often have their outbreak especially during dry season (Adenkunle.et al.2004). High prevalence of diarrhea among children and infants can be due to the use of unsafe water and unhygienic practice. Diseases due to drinking of contaminated water leads to the death of five million children annually and make 1/6 of the world population sick (Shittu. Et al.2008). Also, water may contain toxic inorganic chemicals which may cause either acute or chronic health effect. Acute effects include nausea, lung irritation, skin rash, vomiting and dizziness, sometime death usually occurred. Chronic effect, like cancer, birth defects, organs damage, disorder of the nervous system and damage to the immune system are usually more common (Erah et al., 2002).

Methodology:-

It is very essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purpose. Water must be tested with different physic-chemical parameters. Selection of parameters for testing of water is solely depends upon for what purpose we going to use that water and what extent we need its quality and purity. Water does content different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities. Some physical test should be performed for testing of its physical appearance such as pH, turbidity, TDS etc, while chemical tests should be perform for its BOD, COD, dissolved oxygen, alkalinity, hardness and other characters. For obtaining more and more quality and purity water, it should be tested for its trace metal, heavy metal contents and organic i.e. pesticide residue. It is obvious that drinking water should pass these entire tests and it should content required amount of mineral level. Only in the developed countries all these criteria's are strictly monitored. Due to very low concentration of heavy metal and organic pesticide impurities present in water it need highly sophisticated analytical instruments and well trained manpower. Following different physic chemical parameters are tested regularly for monitoring quality of water.

We have first randomly selected five area of Ratoli village as show in table-I, collected Drinking Water samples in Sterilized Bottles from various Water resources like as Hand pumps, Bore wells, Wells, Ponds, Dam and River etc. We have applied some physicochemical parameter for analysis of drinking water qualities. Temperature, Colour, Odour, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Alkalinity, Hardness and Fluoride etc. first to know the Temperature of each samples at RT by thermometer in °C, The pH by digital pH meter

,Electrical Conductivity Measured by conductivity instrument in **µS/cm**, TDS know by Disk filtration in **mg/l.** Titration Method used for Total alkalinity, Total hardness and The Ca concentration of Drinking Water know in **mg/l** and Fluoride was estimated with standard method as prescribed by Groltman at (1978), Trivedi and geol (1984)and APHA (1998).

Result & Discussion:-

Table-I : Physico-Chemical Parameters of Ratoli Village.

	Temp. ^{0}C	pH -	E.C µs/cm	TDS ppm	Alkalinity mg/l	Hardness mg/l	Ca	F
Site 1	32	7.5	660	332	328	280	90	0.75
Site 2	30	7.8	754	400	240	276	85	1.13
Site 3	29	6.3	560	802	348	302	156	0.78
Site 4	23	7.0	1016	735	290	418	78	0.74
Site 5	20	6.8	1070	754	160	390	64	0.80

pH is most important in determining the corrosive nature of water. Lower the pH value higher is the corrosive nature of water. pH was positively correlated with electrical conductance and total alkalinity(Guptaa 2009).The reduced rate of photosynthetic activity the assimilation of carbon dioxide and bicarbonates which are ultimately responsible for increase in pH, the low oxygen values coincided with high temperature during the summer month. Various factors bring about changes the pH of water. The higher pH values observed suggests that carbon dioxide, carbonate-bicarbonate equilibrium is affected more due to change in Physico-chemical condition (Karanth 1987).The pH values are normal Drinking Water ranges 6.5-8.5 on pH meter scale, the carbonate are much strong alkaline than bicarbonates. we have gain pH value of water from selected area shown in Table-I .The maximum pH value 7.8 at Site-2, The most of bio-chemical and chemical reactions sharply due to change the pH value of Drinking Water.

Total dissolved solids (TDS) are a measure of the combined content of all inorganic and organic substances contained in a liquid in molecular, ionized or micro-granular (colloidal sol) suspended form. Total dissolved solids are normally discussed only for freshwater systems, as salinity includes some of the ions constituting the definition of TDS. The principal application of TDS is in the study of water quality for streams, rivers and lakes, although TDS is not generally considered a primary pollutant (e.g. it is not deemed to be associated with health effects) No health-based guideline value is proposed for TDS. However, drinking-water guidelines are available for some of its constituents, including boron, fluoride, and nitrate. For India: The Bureau of Indian Standards (BIS) fixes the upper limit of TDS in drinking water at 500 ppm. We have our research gain results of TDS Highest 802 ppm at Site-3.

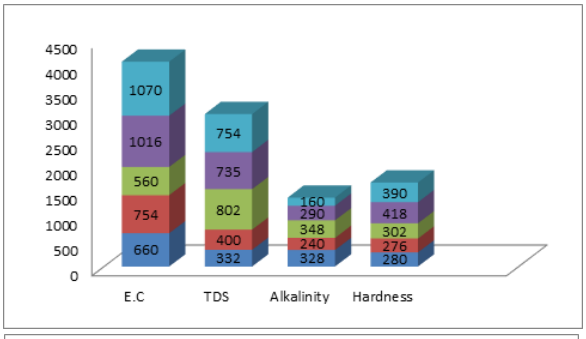
EC(Electrical Conductivity) Conductivity shows significant correlation with parameters such as pH value , alkalinity , total hardness , calcium , total solids, total dissolved solids . Navneet Kumar et al (2010) suggested that the underground drinking water quality of study area can be checked effectively by controlling conductivity of water and this may also be applied to water quality management of other study areas. It is measured with the help of EC meter which measures the resistance offered by the water between two platinized electrodes. Commonly Drinking Water has EC range 500- 800 µS/cm at 25°C. The EC is used to measure the concentration of dissolved solids substances in water [Navneet, et al, 2010]. We have our research gain results of EC Highest 1070 µS/cm at Site-5.

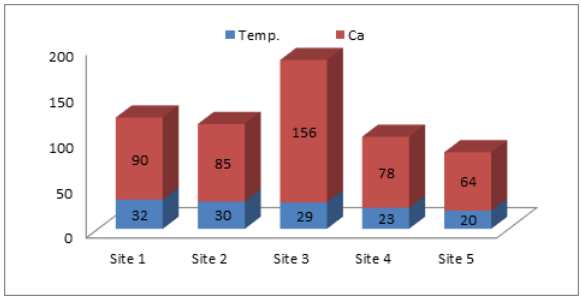
Alkalinity It is composed primarily of carbonate and bicarbonate alkalinity acts as a stabilizer for pH. Alkalinity, pH and hardness affect the toxicity of many substances in the water. It is determined by simple dil HCl titration in presence of phenolphthalein and methyl orange indicators. Alkalinity in boiler water essentially results from the presence of hydroxyl and carbonate ions. Hydroxyl alkalinity in boiler water is necessary to protect the boiler against corrosion. Too high a causticity causes other operating problems, such as foaming. Alkalinly of water is due to the presence of hydroxide carbonate and bicarbonate. Total Alkalinity ranges 200-600mg/l. we gain research results of the Alkalinity values determined first maximum value 348 mg/l at Site-3.

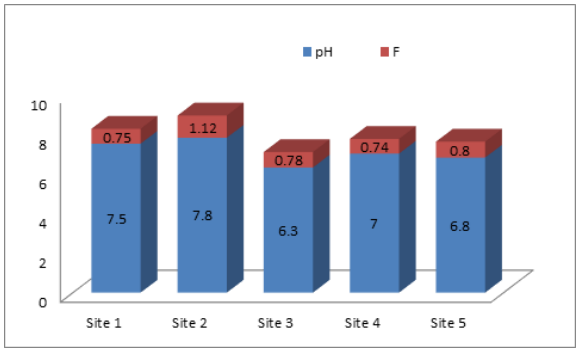
Fluoride does not affect the appearance, taste or smell of drinking water. Water fluoridation is the controlled addition of fluoride to a public water supply reduces tooth decay. Fluoridated water has fluoride at a level that is effective for preventing cavities; this can occur naturally or by adding fluoride recommended fluoride concentration in drinking water limits 1-10.5mg/l ,it is an essential constituent of drinking water mainly because of its role in prevention of dental carries .we have gain experimental result ,the maximum value 1.13 at Site-2.

Conclusion:-

The present paper deals with the study of Physico-chemical parameters of water. The Present study indicates the overall development and urbanization are tell on the quality of water has resulted few untreated wastes that impact can beer easily observed by water minerals properties changed The results obtained from the present investigation shall be useful in future management of drinking water for people who living in Ratoli Village.







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REFERENCES

1. Dr.BachewarM.S,Loharkar D.S., Loharkar K.S.&Pathan A.M.;Department of chemistry Shahir Annabhau Sathe College, Mukhed; Analysis Of Water Quality Using Physico-Chemical Parameters from Dhule Maharashtra;One day national conference on natural resource need for protection ISBN 978-93-5240-104-8(Pg.33-40).
2. Umesh ChaudhariP, Sunil KondulkarP, Atul Wanjari, Nitin Wanjari ; Department of Chemistry, Mahatma Fule College, Warud, Amravati University, India :Analysis of Water Quality Using Physico chemical Parameters from Various Dams of Amaravati District ,Maharshtra,India; International Journal of Scientific Engineering and Applied Science (IJSEAS)–Volume2,Issue-8,August2016ISSN: 2395-3470www.ijseas.com.
3. International Journal of Environmental Science Volume3,No3,2012; Physico-chemical parameters for testing of water – A review by Patil. P.N, Sawant.D.V, Deshmukh.R.N;Department of Engineering Chemistry, Bharati Vidyapeeth's College of Engineering, Near Chitranagari, Kolhapur, Maharashtra, 416013 (INDIA) ISSN 0976 – 4402.
4. Adnan, Amin, Taufeeq, Ahmad, Malik, Ehsanullah, Irfanullah, Muhammad, Masror, Khatak and Muhammad, Ayaz, Khan, (2010), Evaluation of industrial and city effluent quality using physicochemical and biological parameters, Electronic Journal of Environmental, Agricultural and Food Chemistry, 9(5), PP 931-939.
5. Basavaraja, Simpi, S. M., Hiremath, K. N. S. Murthy, K. N. Chandrashekarappa, Anil N. Patel, E.T.Puttiah, Analysis of Water Quality Using Physico-Chemical Parameters Hosahalli Tank in Shimoga District, Karnataka, India, Global Journal of Science

Frontier, Research, 1(3), 2011, 31-34.
6. U. E. Chaudhari, Physico-chemical parameters assessment of dam water in different sites of warud region, RJC, april-june, 7(2), 2014, 156-160.
7. APHA, (1985), Standard Methods For Examination of Water and Wastewater, 20th Edition, American Public Health Association, Washington D. C.
6. Wastewater, 20th Edition, American Public Health Association, Washington D. C. Gupta, D. P., Sunita and J. P. Saharan, (2009), Physiochemical Analysis of Ground Water of Selected Area of Kaithal City (Haryana) India, Researcher, 1(2), pp 1-5.
7. Indian Standard Specification for Drinking Water; IS: 10500: 1992. (Reaffirmed 1993)