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Study of physicochemical characteristic of ground water from different sites in Nanded city

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ABSTRACT

Physicochemical study of different sites of water sample station from drinking water quality of ground water of Nanded city. At eight different station have been studied . different parameter including PH, conductivity, total alkalinity, total dissolved solids , total hardness, dissolved oxygen, chemical oxygen demand , chloride, sulphate, sodium, potassium , calcium, magnesium etc. are determined. The ground water quality varies from place to place. systematic study was carried out to determine the quality of ground water sample from different sites in Nanded city.

Key words:- Ground water, PH, TH, conductivity, COD , DO, temp.

INTRODUCTION

Nanded city has history that dates back to over 7 century with population of 4.3 lakh (2001 census) it is the second largest city in the marathwada region of Maharashtra state. The city and the immediate region famed for its socio-cultural uniqueness and endowed with the river Godavari and several places of religious significance , is most popular for sachkhand gurudwara. Ground water is a measure source of water for majority of all cities and villages. Physicochemical study have been carried out in recent year at different places^{1,2} The main objective of present study was to asses the quality of ground water at Nanded city(M.S.) which has been used for drinking as well as other domestic purpose for long time. Physicochemical study have been carried out at different eight stations of tubwells of Ganesh Nager (S₁), Kailashnagar(S₂), Chaitnyanagar(S₃), Anandnagar(S₄), Sangvi(S₅), Vazirabad(S₆), Chikalwadi (S₇,Pawdewadi (S₈).

Water is the most important element for existence of life the quality of water is of vital concern for mankind. The determination in the quality of water is however is direct effect of human interference in natural cycle^{3,4} . Ground water contributes an important component of total water

system for human consumption The ground water is generally is polluted due to urbanization, industrial growth and other man made problems^{5,6}. The ground water quality varies from place to place with the depth of water. A systematic study was carried out to determine the quality of ground water sample from different sites in Nanded city.

EXPERIMENTAL SECTION

The sample of ground water collected from the tubwell in selected stations in Nanded city. The samples were collected as per slandered procedure by APHA, AWWA (1985)⁷. Before water sampling all the double stoppered polythene container were cleaned and rinse thoroughly with water sample. water sample were brought to laboratory in an insulating box. The physicochemical analysis was done using standard procedures^{8,9}.

A.R. grade chemical were used for preparations of standard solutions. PH was measured using Ellico PH meter, the temperature was recorded using centigrade thermometer. Conductance is measured using standard conductometer. Na, K, Ca was measured by Dr. Lange flame photometer. TDS, DO, COD, alkalinity, TH, Chloride, Sulphate, Magnesium, were determine by standard procedure given by APHA. During the time of work different equipments, materials, chemicals and methods were used for study.

RESULTS AND DISCUSSION

Physicochemical characteristic of ground water samples presented in the table. The ground water is used for drinking, washing, Industrial and domestic purposes. The phesicochemical properties are compared with IS and WHO standards.

Form the result it is evidenant that the temperature of water samples ranges between 26.3-27.5°C. The variation in the water temp. may be due to difference in timing in collection¹⁰. The PH of the sample was determine by using PH meter, PH was found in the range 6.2-7.6. WHO recommended maximum permissible limit of PH form 6.5- 9.2. The station no. 6 shows the pH 6.2 which is slightly acidic which is bellow the permissible limit according to WHO¹¹. The conductivity measures the concentration of salt in water. Electrical conductivity of the sample varied from 543-766 ms⁻¹. The highest value of conductivity may due to high concentration of ionic constituents present in water bodies¹². Total alkalinity was found in the range of 98-188 mg/l. alkaline water may decrease the solubility of metal. The high alkalinity of ground water due to the presence of bicarbonate and some salts¹¹⁻¹³. The total alkalinity is found in the range.

In the presence study the chloride concentration were found in the range 117-188 mg/l. the chloride limit for drinking water is specified as 200-600 mg/l (WHO 1984)¹⁴. The chloride contain normally increases with the increase mineral containts. chlorides are relatively harmless except when converted to Cl₂, ClO⁻ and ClO₃⁻ which are toxic. Chloride values of all samples were found in the below the desirable value.

Hardness is an important in decreasing the toxic effect of poisonous elements. The hardness was found within the range. i. e. 265-430mg/l. The TDS of the sample is range 451-662 mg/l. The ISI standard of dissolved solids is up to 500 mg/l. drinking water quality is affected by the presence of different soluble salts. The TDS is an important parameter in drinking water quality standards¹⁵.

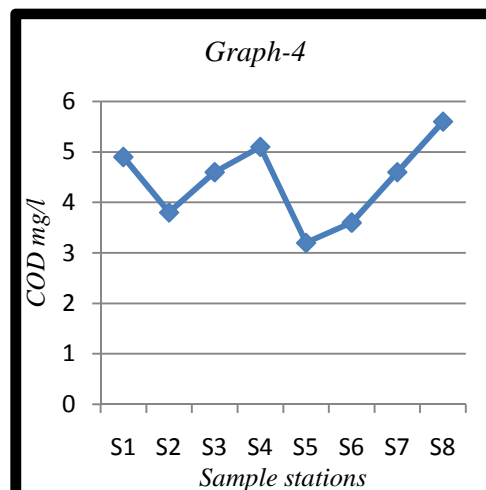
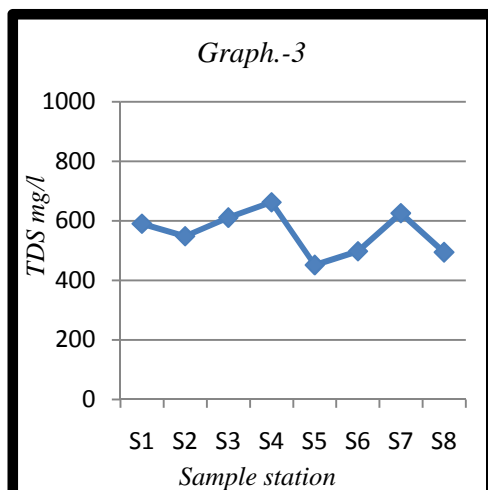
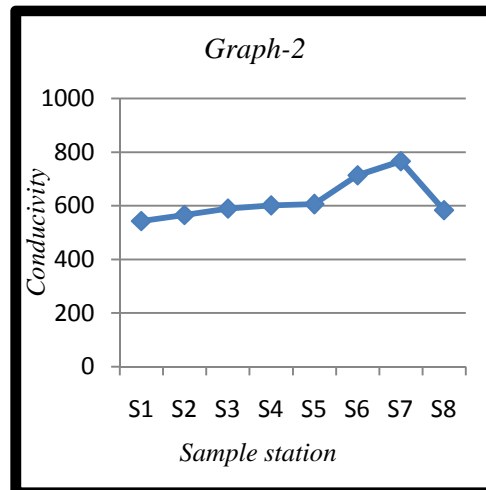
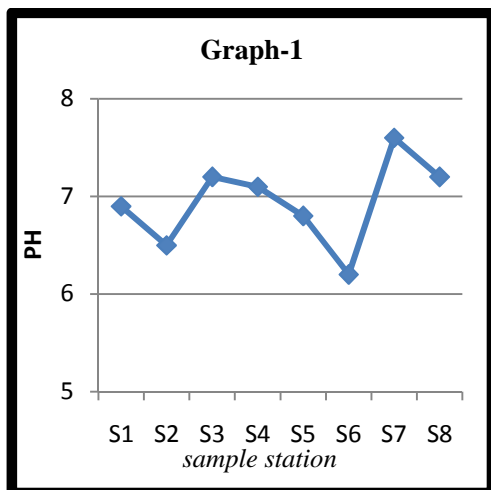
Dissolved Oxygen in water is an great importance to all aquatic organism and is consider to be the factor that reflect the biological activity taking place in water bodies and determine biological changes which is brought about by aerobic organism in presence study dissolve oxygen ranges from 6.4-7.8 mg/l. The DO values of all samples were found within permissible limit as 5-9 mg/l (WHO-1984.).

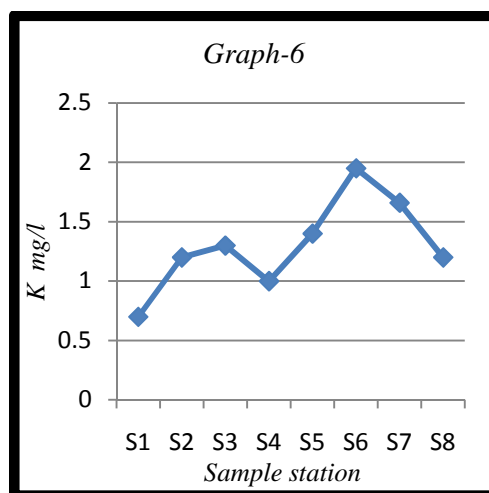
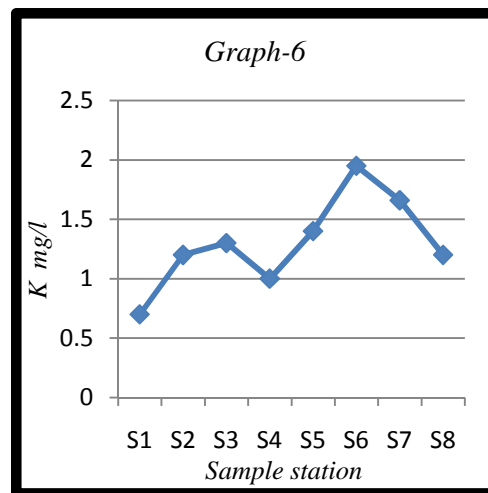
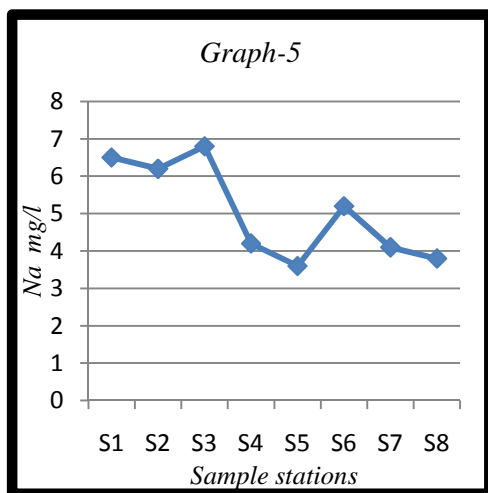
COD determines the oxygen required for chemical oxidation of organic matter. COD values convey the amount of oxydisable organic matter including non biodegradable matter present in it¹⁶. COD was determine by potassium dichromate open refluxed method. The value of COD found in the range 3.2-5.6mg/l. The concentration of sulphate, calcium , magnesium, Sodium is in the desirable limit according to IS and WHO standards. The Na, K and Ca where determined by flame photometer.

Table. No. 1: Physicochemical data of ground water.

S.	Temp. °C	PH	Cond. ms ⁻¹	T.A. mg/l	TDS mg/l	TH mg/l	DO mg/l	COD mg/l	Cl mg/l	SO4 mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l
S ₁	26.6	6.9	543	102	590	288	7.8	4.9	148	102	74	43.2	6.5	0.7
S ₂	27.0	6.5	566	168	548	305	7.5	3.8	153	77	71	32.8	6.2	1.2
S ₃	27.5	7.2	590	98	610	265	6.4	4.6	149	78	68	46.6	6.8	1.3
S ₄	26.4	7.1	602	104	662	312	7.3	5.1	162	80	108	38.5	4.2	1.0
S ₅	26.3	6.8	606	142	451	364	6.8	3.2	188	80.4	112	44.3	3.6	1.4
S ₆	27.2	6.2	714	148	498	374	7.4	3.6	165	86.6	69	47.5	5.2	1.95
S ₇	26.8	7.6	766	176	626	430	7.8	4.6	117	76.2	110	46.2	4.1	1.66
S ₈	26.6	7.2	584	188	494	340	6.9	5.6	160	66.5	68	42.5	3.8	1.2

S- sample station., TA- Total alkalinity.





CONCLUSION

The results indicate that value of different parameter like temp., PH., Conductance, total alkalinity, TDS, TH. DO. COD, Cl, SO₄, Ca, Mg, are found within the permissible limit as IS and WHO standards. Presence study indicate that the ground water of tubwell located in the area of Nanded city by observing the result it can be concluded that the parameters which were taken for study of ground water quality are below the pollution level and it can be used for various purposes like domestic, agricultural , Industrial etc.

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REFERENCES

- [1] C.L. Patil, H.O.Deore *Poll.Res.*23(2) 395-398 (2004).
- [2] Dhembre A.J. , Phonda G.M. and Singh *Poll. Res.* 17(1) 87-90 (1998).
- [3] A.K.De., Environmental chemistry, third edition .
- [4] Alka Gupta, Analytical chemistry. Pragati prakashan.
- [5] R.M. Varma, Analytical chemistry, third edition.
- [6] B.K. Sharma. Environmental chemistry.
- [7] APHA 1985 standard method 17th Ed. American public health education 1985.

- [8] V.P. Kudesia, Environmental and health technology ,(1986).
- [9] APHA, AWWA, CPE (1992), Standard method for examination of water and waste Inc Newyork pp 1130.
- [10] Jayaraman P.R. , Gangadevi .T. and Vasuena Naya , *Poll. Res.* 32(1),89-100 (2003).
- [11] Abbasi A. Khan F.I. Sentilvank and Shabuden A. 1999 *J.ENV.*4193-176-183
- [12] P. Zuddas, F. Podda. *App. Geochem.* 2005, 20. 507.
- [13] N Manivaskam. Physicochemical examination of water Pragati prakashan , Meerut, India, 1983.
- [14] S. Hooda, Kaur. Laboratory manual for Environmental chemistry S. Chand and Co. Ltd. 1999.
- [15] Vilas y. Sonwane, *J. Chem. Pharm. Res.* 2010,2 (5)-104-107.
- [16] Ranjeeta Choudhary, et. al. *Ultra chemistry* Vol. 7(1), 71-78.(2011).