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SHORT COMMUNICATION

PHYSICO-CHEMICAL CHARACTERISTICS OF GROUNDWATER QUALITY OF MANSAROVAR COLONY IN JAIPUR

Ranjana Agrawal*and Jeetu Singh Gaur

Department of Chemistry, International College for Girls, Gurukul Marg ,
S.F.S., Mansarovar, Jaipur, Pin-302020, INDIA
E.Mail: ranjana1904@rediffmail.com.

ABSTRACT

Assessment of underground water quality based on physico-chemical parameters of Mansarovar area at Jaipur city has been taken up to evaluate its suitability for domestic's purpose. Ground water samples from were collected from different places of Mansarovar colony. The quality analysis has been made through the pH, EC, TDS, Dissolved Oxygen, BOD, COD, Total Hardness, Sodium, Pottassium, Calcium, Magnesium, Chloride, Sulphate, Nitrate, Fluoride and Alkanity. A systematic calculation of the correlation coefficient has also been carried out between different analysed parameters. The Physico-chemical analysis reveals that 3 water samples where Electrical conductivity was more than limit may be used for drinking purpose only after proper treatment.

Key Words : Ground Water, parameters

INTRODUCTION

Water is essential component of life. It is unique liquid in the sense that without it no life in possible. Groundwater forms a major source of drinking water. Ground water moves through varied geological environments and during its flow many chemical compounds will be dissolved in it. The modern civilization, industrialisation, urbanisation and increase in population have lead to fast degradation of our ground water quality. As the water is the most important component of eco-system, any imbalance created either in term of amount, which is presence of imputities added to it can hard the whole eco-system¹.

It is generally believed that ground water is pure and safe to drink. However, this is not true. In fact ground water can easily be polluted from waste generated from domestic, industrial and agricultural sources. The quality of public health depends to a greater extent on the quality of ground water, which should be clean and fresh. Excess of fluoride causes dental, skeletal and non skeletal fluorosis through continued use of fluoride contaminated water, air and agriculture produce². In 23 villages of Challapalli madal the quality of well water was assessed and it was found that there is a higher incidence of fluoride³. Chemical analysis of ground water samples from Nagpur showed that fluoride and nitrate concentration increases with increase in salinity⁴. It was found that alkanity and fluoride donot exhibit any significant effect on nitrate⁵. Faunistic studies in the area of Khetri Nagar were done and analyzed the water from the wells⁶⁻⁷. It was found that fluoride contents from the wells from different sites to vary from 0.87 to 1.01ppm.

Mansarover colony is the biggest residential colony of ASIA. It is necessary to analyse the Physico-chemical parameters of drinking water(Ground water). The study was conducted to know the physico chemical properties of ground water and in different seasons and its impact on human life.

EXPERIMENTAL

Sample Collection and preservation:

Polythene bottles of 2.5 litres and 2.0 litres were used to collect the water samples from different locations of the mansarovar colony. The samples were collected from borewells as well as from deep handpumps in the month of November 2008. The samples were also collected in different seasons. It was ensured that the concentrations of various water quality parameters do not changes in time that elapses between drawing of samples and the analysis in the laboratory. For BOD, COD separate 2 litres polythene bottles were used. The bottles were thoroughly cleaned with Hydrochloric acid and then washed with tape water rendered free of acid and than washed with distilled water twice and again rinsed with the water sample to be collected and then filled up the bottle with the sample leaving only a small air gap at the top, stopper and sealed the bottle with paraffin wax. Some samples which were turbid or containing suspended matter were filtered at the time of collection⁸.

Requirements:

All the glassware, casserole and other pipettes were first cleaned with tape water thoroughly and finally with de-ionized distilled water. The pipettes and burette were rinsed with solution before final use. The chemicals and reagent were used for analysis were of analar grade. The pH meter, conductivity meter, spectrophotometer, flame photometer instruments were used to analyze these parameters. The procedure for calculating the different parameters were conducted in the laboratory.

Table-1: Analysis of samples Collected from Mansarover Colony

Total Samples - 12

Parameter and Unit	Within Maximum Permissible Limit			Out of Maximum Permissible Limit			Unit
	Value	No. of Samples	%	Value	No. of Samples	%	
pH	<=9	12	100	>9	0	0	
E.C.	<=2000	9	75	>2000	3	25	µm/cm
T.H.	<=600	11	92	>600	1	8	mg/l
T.D.S.	<=1500	10	83	>1500	2	17	mg/l
Ca	<=200	12	100.0	>200	0	0.0	mg/l
K	<=10	11	92	>10	1	8	mg/l
Na	<=200	9	75	>200	3	25	mg/l
SO₄	<=400	12	100	>400	0	0	mg/l
NO₃	<=24	7	58	>24	5	42	mg/l
Cl	<=1000	11	92	>1000	1	8	mg/l
Fl	<=1.5	7	58	>1.5	5	42	mg/l
Mg	<=100	11	92	>100	1	8	mg/l
Alkalinity	<=600	10	83	>600	2	17	ppm
DO	<=5	8	67	>5	4	33	ppm
BOD	<=10	5	42	>10	7	58	ppm
COD	<=10	3	0.0	>10	9	75	ppm

* Maximum permissible limit or highest relaxable limit or Maximum relaxable limit are set by W.H.O., I.S.I., I.C.M.R., Govt. of India.

RESULTS AND DISCUSSION

The samples collected from mansarovar colony were analyzed and presented in Table-1.

The value of pH was within maximum permissible limit in all samples. E.C. in only in 3 samples were high and was more than 2000 µm/cm. Total hardness in only one samples was more than 600 mg/l. TDS was more than 1500 mg/l in 2 samples. Calcium and Sulphate content in all 12 samples were within maximum permissible limit. In 9 samples (75%) Sodium were within limit. Potassium, Chloride and

Magnesium were within maximum permissible limit except 1 sample. Alkalinity in 2 samples, Nitrate in 5 samples was out of maximum permissible limit. Fluoride content was high in 5 samples which is 42% of the samples analyzed. D.O. was within the limit in 8 samples. BOD in 7 samples and COD in 9 samples were out of range.

The Physico-chemical analysis reveals that 3 water samples where Electrical conductivity was more than limit may be used for drinking purpose only after treatment. In 2 samples TDS was high. 5 samples having Fluoride contamination high which is 42% of the total samples. These samples are close to Amanishah nala area.

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