

Physico-chemical analysis of drinking water of Gandhi Nagar area of Bhopal special reference to pollution

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ABSTRACT

Physico-chemical analysis of drinking water of Gandhi Nagar area of Bhopal city has evaluated in different sampling stations for one year during 08-09 in different seasons. The samples are collected from different sampling stations in clean Jerry cans and carried to laboratory for analysis of different parameters, pH, EC, free CO₂, chloride total alkalinity, T-H, Ca-H, Mg-H, D.O, B.O.D., C.O.D., NO₃, SO₄ and Fluoride. The present study has its significance for public hygiene in public interest.

Key words: Water quality, evaluation parameters, hygiene, physico-chemical analysis, bore-well, Gandhi Nagar.

INTRODUCTION

Bhopal is the capital of Madhya Pradesh. Water samples of bore-wells water are collected in 2-litre clean polythene jerry-cans after flushing the bore-wells to analyses. The procedure has adopted as prescribed by APHA (1985) NEERI (1986) Presterilized bottles are used to collect the D.O. & B.O.D samples. Temperature pH of water samples has measured at the sampling stations. In the present study temperature varied from 25-28.5°C. pH indicates the intensity of acidity. Electrical conductivity of water samples range from 220 – 988 μ mhos/cm that measure the dissolved ions and has the capacity to carry on electrical charge of both cations and anions.

Free CO₂ ranges from 6.0 – 32.8 ppm chloride, total alkalinity, Total hardness Ca-H and Mg-H are observed in the range of 18.2 – 128.28, 22.8 – 364, 104.8 – 384, and 72-312 and 24-72.4 ppm respectively at different sampling stations. Higher values of alkalinity are due to leaching of soil during natural filtration of water from sewage. D.O., B.O.D. and C.O.D. range from 1.14 – 2.68, 2.00 – 3.20 and 20.8-78.8 ppm respectively as

summarized in Table – 1 Nitrate concentration in ground water is due to leaching of nitrate with percolation of water. Nitrate in this study varies from 3.2-12.4 ppm is well within the permissible limits. Sulphate is an important constituent of hardness with Ca and Mg. Excess amount of sulphate in water has cathartic effect of human health Rangwala, KS and Rangwala PS (1927)⁵. Sulphate in this study ranges from 32.2-70.6 ppm. The findings are similar with Kataria (1996)², (2000)³. Most of the parameters are found within the permissible limits as recommended WHO 1978⁶.

Hence water samples analyzed in the present study has found suitable for drinking purpose after proper required treatment.

Fluoride concentration in the present study is found lower value of 0.06 at SS₁ and higher 1.0 at SS₆ the findings are similar to these of Kataria *et. al.* (2008,2009) The value of 0.8 to 1.0mg/L of F-has been recommended by WHO (1970) Fluoride is important content of water to teeth and other pathological changes and has assumed considerable importance to public water supply and resources.

Table 1: Physico-chemical analysis of drinking water of Gandhi Nagar

Parameters	Unit	Area of Bhopal City 2008 – 09 Mean seasonal values (Winter, Summer & Monsoon)							
		SS ₁	SS ₂	SS ₃	SS ₄	SS ₅	SS ₆	SS ₇	SS ₈
Temperature	oC	24.3	26.0	27.2	27.2	27.1	26.5	24.9	28.0
pH	-	6.3	6.5	7.2	7.0	7.4	7.5	7.7	7.8
EC	Umhos/cum	322	236	388	258	680	488	564	968
FreeCO	ppm	6.4	11.6	32.4	7.8	20.6	20.4	23.2	32.5
Chloride	ppm	18.2	70.4	39.8	65.0	128.12	112.8	120.8	136.4
Total alkalinity	ppm	104.92	132	148	102.8	288	295	376	288
Total hardness	ppm	104.9	132	148	102.8	288.2	294	372	386.4
Ca-H	ppm	72.1	88	108	72.8	246.2	254	280	314.2
Mg – H	ppm	32.8	44	40	30.0	42.0	40	112	072.2
D.O.	ppm	1.16	1.42	2.28	1.62	2.54	1.82	2.44	2.70
B.O.D.	ppm	2.04	3.64	2.24	12.4	1.94	3.74	3.40	3.80
C.O.D	ppm	20.92	25.8	12.8	78.4	36.0	25.92	69.8	82.8
Nitrate	ppm	3.24	7.8	3.6	16.8	13.6	15.4	10.4	16.8
Sulphate	ppm	34.4	36.4	46.8	50.4	54	64	70.4	90.2
Fluoride	ppm	0.06	0.08	0.80	0.70	0.90	1.0	0.80	0.60

SS₁ = Near Asharam Babu AshramSS₂ = Pratap wardSS₃ = Arjun WardSS₄ = Tagore WardSS₅ = Pardi MohallaSS₆ = Sagar Instt. of Tech.SS₇ = Exotica ResidencySS₈ = Jatkhedi.**REFERENCES**

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