

Physico-chemical assessment of drinking water of T.T. Nagar area of Bhopal (M.P.) India

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ABSTRACT

Physico-chemical assessment of drinking water of bore-wells of T.T. Nagar area of Bhopal has studied in different season (Summer, winter and monsoon) for one year during 2005-06, Two readings in one season have investigated to analyses different parameters i.e. temperature, pH, EC, Free CO₂ chloride, total solids, S.S. (Suspended Solids), T.D.S. (Total dissolved solids), total alkalinity, total hardness, Ca-H, Mg-H. The results are observed in the range of 24.9-28.9°C, 6.77-7.9, 226-1014 umhos/cm, 17.8-378.6, 23.1-372, 518-632, 312-356, 208-282, 109.4-378.6, 105.6-393.4, 76-218, 32.8-91.0, while D.O., B.O.D. and C.O.D. ranges from 1.20-2.80, 2.08-3.96, 14.8-86.4 ppm, Nitrate and Sulphate are found in the range of 3.8-13.9, 30.8-74.6 ppm respectively.

Key words: North T.T. Nagar, physico-chemical, assessment, Hygienic, analysis.

Bhopal is the capital of madhya pradesh, water samples of drinking water (bore-wells) are collected in live clean polythene jerry-canes after flushing the bore wells upto 5 minutes to analyses different selected parameters water in the most important commodity for all living beings the changes in physico-chemical parameters are the direct and indirect indices of water quality index, proper ground water samplings and analysis are very important to assure effective monitoring. T.T. Nagar area, has 35,000 population and the main source of drinking water is mainly bore-wells and municipality supply of water. Due to urbanization and population growth, the water quality has deteriorated day-by-day mains activity.

The methods for analysis are same as prescribed by NEERI (1986) 8 bore-wells of densely populated area has chosen for samplings.

The results are summarized in table 1. In the present study, temperature accelerated the chemical reactions in water higher value of

temperature accelerates chemical reactions in water higher value of temperature accelerates chemical reactions in water. Ph indicates the intensity of acidity and alkalinity and measures H⁺ ions in water. in this study, minimum pH 6.2 is rated at BW8 and maximum of 7.3 at BW2 PH 6.2 is rated at BW8 and maximum of 7.3 at BW2 in summer and monsoon seasons. EC measures the dissolved ions, it ranges from 226-1014 umhos/cm. minimum value of EC recorded at BW1 and maximum at BW5 Groundwater used for drinking purpose is extra rich in CO₂, as water comes from percolation through various strata and it absorbs a large amount of free CO₂ it ranges from 6.8-35.6 ppm. chloride, total solids S.S. (Suspended solids) and T.D.S. ranges from 17.8 (BW1) 129.4 (BW7) 516-632, 308-356 and 208-282 ppm. Respectively at different sampling stations. Total alkalinity T-H, Ca-H and Mg-H, ranges from, 109.4-378.6, 105.6-148, 76-362.8 and 20.2-91.0 ppm. Reservedly D.O., B.O.D. and C.O.D ranges from 1.20-2.80, 2.08-3.94 & 14.8/-86.4ppm respectively.

Table 1: Mean sear and values (Summer, winter and monsoon)

Parameters	Unit	Bw1	BW2	BW3	BW4	BW5	BW6	BW7	BW8
Temperature	Oc	24.9*	25.0	25.4	26.3	28.9	27.2	27.4	28.6
Ph	-	7.0	7.3**	6.5	6.8	7.2	6.2	6.4	6.2*
E.C.	umhos/cm	226.0*	370	864	886	1014	1002	996	972
Free Co2	PPM	7.8	6.8*	25.4	28.4	35.6**	22.4	14.6	24.8
Chloride	"	17.8*	72.8	40.6	54.8	128.4	112.6	129.34**	117.4
Total solids	"	516.0*	576.0	585	597	622	623	632**	510
Suspended Solids	"	312.0	342.0	344	308*	356**	316	326	342
TDS	"	208*	218	232	242**	282**	262	244	238
Total Alkalinity	"	109.4*	186	283	378.6**	116	276	262.4	264
total hardness	"	108.8	105.6*	130	148**	392.4	288	294	374
Ca-H	"	76.0*	85.4	108	218	362.8**	260	272	350
Mg-H	"	26.8	20.2**	22	91.0**	29.6	28	22	24
D.O.	"	1.20*	1.22	1.34	2.80**	1.64	1.68	1.82	2.4
B.O.D.	"	2.08*	2.28	2.24	3.94**	3.62	2.48	2.60	3.2
C.O.D.	"	14.8*	52.4	50.8	86.4	20.8	28.4	44.8	74.0
Nitrate	"	3.8*	4.0	4.4	13.9**	4.64	12.2	12.4	10.0
Sulphate	"	30.8	32.6	74.6**	36.4	32.8	68.4	54.6	64.2

BW1 Mata mandir, BW4 = SBI TT Nagar New Market BW7 = Malviya Nagar BW2 Harswardan Nagar BW5=Rangmahal BW8 = North TT Nagar

Nitrate concentration in ground water is due to leaching of nitrate with per colation of water. In this study nitrate varies from 3.8-13.9 ppm is well with in the permissible limits sulphate is an important constituent of hardness with ca & Mg Excess amount of sulphate in water has cathartic effect of human health. Sulphate in this study ranges form 30.8 to 74.6 ppm. The finding are similar with kataria

(1996), 2000, 2006. Most of the parameters are found well within the permissible limits as recommended by WHO (1978). Hence water samples, in flood situation of Aug. 2006a t Bhopal are analysed properly in this study the drinking water resources the found suitable water for drinking purpose after proper required treatment.

REFERENCES

- Standard methods for the examination of water and waste APHA, 13th ed. New York (1985).
- Kataria, H.C., Gupta, S.S. and Jain O.P., *Poll, Res* 14(4): 455-462 (1996).
- Kataria, H.C. Preliminary Study of Drinkingw water of pipariya township, poll. Res. 19(4): 645-649 (India)
- Kataria *et al.*, Physico-chemical analysis of bore-well water of Bairagrah area of Bhopal city, *Orient. J. Chem.*, 22(1): 183-184 (2006).
- NEERI, manual on water and water analysis, Nations Envnrionmental Engineering Research Institute Nagpur, 3402 (1986).
- WHO, Environmental Health Criteria, 5 Genewa (1978).