



ANALYSIS OF GROUND WATER OF KRUSHNANAGAR (NORTH) IN MUNICIPAL AREA OF BHAVNAGAR (GUJARAT)

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ABSTRACT

Seven sampling points were selected at different depths for the study in Vadava-B Ward in Municipal area of Bhavnagar in March-2008. The parameters studied were temperature, pH, chloride, sulphate, total hardness, total alkalinity, turbidity, and TDS. The ionic concentration is expressed in mg/L.

Key words : Water quality, TDS, Bhavnagar.

INTRODUCTION

Ground water is the most important source of water supply for drinking, irrigation and for industrial purpose. The natural quality of ground water tends to be degraded by human activities. Municipal and industrial water entering in to an aquifer are the major source of organic and inorganic pollutants. Water is polluted in all the parts of earth and Krushnanagar (North) is no exception to this phenomenon.

Due to rapid growth of industrialization and urbanization, much sewage water is disposed off that generates fair chances of ground water pollution. The pollutants in ground water may reach by leaching, drainage and surface runoff during monsoon and hence, it is essential to study quality of water.

EXPERIMENTAL

Water samples were collected in cleaned borosilicate bottles washed with acetone

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in month of April at selected sampling sites (Dunky-Hand pump) see Fig. 1 (KN₁, KN₂, KN₃, KN₄, KN₅, KN₆, KN₇) between 05.00 p.m. to 06.30 p.m. at different depths and brought to the laboratory of Industrial Chemistry, Sir P. P. Institute of Science for study of properties of ground water.

Temperature of the water was measured in Equip-tronics digital auto temperature meter. Borosilicate glass wares, distilled water and E. Merck reagents were used throughout the testing. pH values of water sample under investigation were measured using Equip-tronics pH meter, type No. 611. The pH was standardized by buffer solutions of 4.0 pH and 10.0 pH by E. Merck buffer tablet.

The chloride ions were generally determined by titrating the water samples against a standard solution of AgNO₃ using potassium chromate as an indicator. Sulphate was estimated by UV-visible Spectrometer, type-II. Total hardness was determined by complexometric titration with EDTA using eriochrome black-T as an indicator. Total alkalinity of the water was determined by titrating with N/50 H₂SO₄ using phenolphthalein and methyl orange as indicators.

Turbidity was measured by digital turbidity meter, type No. 611. TDS was estimated by digital TDS meter, type No. 703. All the measurements were made by reported methods¹⁻⁸.

RESULTS AND DISCUSSION

The pH of the water indicates the degree of deterioration of water quality. The desirable pH range necessary for drinking water is from 7.0 to 8.5. The pH value of water sample in the study area ranged from 7.1 to 9.3. This shows that pH of water sample was slightly alkaline.

The concentration of chloride in the sample was found to 310 to 447 mg/L. High chloride contents have poisonous effects on plants, animals and human beings. The concentration of sulphate was found to be 22 to 69 mg/L.

Total hardness was found in the sample water ranges of 343 to 534 mg/L. The desirable limit for total alkalinity is 200 mg/L. The values of total alkalinity of ground water samples varied from 279 to 586 mg/L.

Turbidity is one of the common forms of pollution. This prevents growth of the

aquatic plants by reducing rate of their photosynthesis. This becomes obstacle for self purification of water. Turbidity in water samples was found between 19 to 86 NTU. The value of TDS was found in the samples of water between 1001 to 1850 mg/L.

Table 1: Properties of ground water

Properties	KN ₁	KN ₂	KN ₃	KN ₄	KN ₅	KN ₆	KN ₇
Depth (m)	50	60	70	60	40	55	50
Temperature (°C)	28	28	28	30	30	30	29
pH	7.1	7.2	7.4	9.1	8.3	8.5	9.3
Chloride (mg/L)	360	333	310	365	351	368	447
Sulphate (mg/L)	57	69	29	22	30	59	33
Total hardness (mg/L)	418	415	512	367	343	440	534
Total alkalinity (mg/L)	449	310	279	313	430	535	586
Turbidity (NTU)	86	19	68	78	69	51	46
TDS (mg/L)	1494	1850	1023	1001	1150	1615	1314

KN₁= Excel, KN₂= Near bus-stand Anandnagar (1st), KN₃= Near bus-stand Anandnagar (12th), KN₄= Near Mekladimanidhar, KN₅= Vankarvaas, KN₆= Near Disposal plot, KN₇= Kansaranala.

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