

PHYSICO-CHEMICAL ANALYSIS OF UNDER GROUND WATER OF DIST. ANAND, INDIA

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ABSTRACT

A report of physico-chemical analysis and study of the water samples taken from the region nearby Anand district of central Gujarat is presented here. Six water samples are subjected to physico-chemical analysis like pH, TDS, Hardness, Conductivity, Dissolved Oxygen and Chemical Oxygen Demand. The results are analyzed comparatively and conclusions regarding the suitability of the use of such waters are made

Key words : COD, DO, Sulfate, TDS.

The water plays a vital role in human life. The consequence of urbanization and industrialization leads to spoil the water. For agricultural purposes ground water is explored in rural areas especially in those areas where other sources of water like dam and river or a canal is not available. During last decade this is observed that the ground water get polluted drastically because of increased human activities^{1,2}. Consequently, number of cases of water borne diseases have been seen which is a cause of health hazards^{3,5,6}. So basic monitoring on water quality has been necessitated to observe the demand and pollution level of ground water⁴. A good number of water analysis experiments are regularly conducted by different groups of chemists and biologists across the country^{7,8,9,10}.

The present work is an attempt to examine the water quality of various potable water sources viz. ground water at GIDC, ground water at Vidyanagar, tape water, Mahi river water in Anand district.

MATERIALS AND METHODS

All the samples were collected in the month of January 2007. The locations selected for the investigation are Vallabh Vidyanagar, Bakrol, Anand, Vithal Udyognagar, mineral water. The samples are collected in sterilized and phosphate free bottle. The collected samples were analyzed on various physico-chemical analysis. The procedure for analysis followed "Standard Methods of Analysis of Water and Wastewater¹¹" (APHA). The various parameters included analysis of Temperature, pH, Dissolved oxygen, cations and anions, hardness. For the

analysis, chemicals used were of analytical grade and instruments are to limit of precise accuracy.

RESULTS AND DISCUSSION

The physical and chemical parameters exhibited considerable variations from sample to sample. All the measurements were carried out in the vicinity of 30° C. The observations are summarized in the table (Table 1).

From the above table, the following observations are made:

It is observed that the pH of the water was slightly alkaline (7.6 to 8.3) and only minor fluctuation in pH was recorded. The pH levels were within the limits set for domestic use as prescribed by APHA¹¹.

The WHO has suggested a limiting value of 500 mg/l. of TDS for potable water. In the present investigation this limit is not crossed on either side by any of the samples under study. However, in the S-6, the TDS value is about to reach the maximum permissible limit. The waters of the remaining samples have registered handsome values of TDS (140 – 280). These values are acceptable for domestic use and agricultural purposes. An overwhelming value of TDS has also increased the conductivity values of the different water samples ranging from 170 to 1300.

The summation of calcium hardness and magnesium hardness is regarded as the total hardness of water. In the present investigation, it has been observed that the calcium concentration is at least two folds greater than that of magnesium. Each of the samples has registered a high value of calcium hardness (30-200mg/l), magnesium hardness (15-120 mg/l) and in turn the total hardness (45-320 mg/l) as shown in the table. The limiting values