

Physico-chemical Parameters of Ground Water in Aligarh City

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Abstract—Ground water samples were collected from different sampling point in Aligarh City and analysed for water quality parameters viz. total alkalinity, pH, total dissolved solids, chloride and total hardness. The total alkalinity are varied in the range 310 to 605 mg/l. The hardness of water found in the range between 250 to 600 mg/l.

The pH value of the study area ranges between 6.9 to 8.4 indicating that ground water is slightly alkaline. The total dissolved solid values ranges between 513 to 1910 mg/l.

Keywords: Physico-chemical parameters, Ground water quality, Total alkalinity, Total hardness, TDS

1. INTRODUCTION

Water is one of the most important constituent for survival of life on earth as well as aquatic life. All the living creatures depend upon water in one way or the other. The ground water is said to be less polluted than surface water [1-2]. But during last few decades, it has been found that ground water get polluted tremendously due to increased human activities [3-6], industrialization, urbanization and agriculture etc. which causes water born diseases and effect human health [7-10]. In urban and rural areas, ground water is most suitable fresh water resource for human consumption.[11]. There are several states in india where more than 90% population is dependent on groundwater for drinking and other purposes [12]. Various physico-chemical parameters like pH, alkalinity, total hardness, total dissolved solid, calcium, magnesium, nitrate, sulphate have a important role in determining the potability of drinking water.

The aim of the present study is an attempt to investigate the physico- chemical parameters of groundwater in Aligarh city.

2. MATERIALS AND METHODS

Aligarh is located at the coordinates 27.88 N 78.08 E. It has an elevation of approximately 178 metres (587 feet). The city is in the middle portion of the doab, the land between the Ganges and the Yamuna rivers. Aligarh is an important business centre of Uttar Pradesh and is most

famous for its lock industry. Aligarh locks are exported across the world. In 1870, Johnson & Co. was the first English lock firm in Aligarh. In 1890, the company initiated production of locks on a small scale here.

Ground water samples were collected from 8 different sampling point. The samples for the analysis were collected in 500ml polyethylene bottles. pH were determined at the site. The samples were analyzed using standard method, APHA 1995 [13]

Table 1: Water quality parameters of drinking water in Aligarh City

Parameters	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8
pH	6.9	7.2	7.4	7.6	7.8	8.4	8.0	7.9
Total Alkalinity (mg/l)	310	370	410	450	512	605	530	550
Chloride (mg/l)	330	225	285	795	985	849	879	892
TDS (mg/l)	513	1910	1820	625	785	887	1750	1520
Total Hardness (mg/l)	250	319	545	600	454	554	475	385

3. RESULTS AND DISCUSSION

The acidic or alkaline content of water is indicated by pH. The pH value of the study area ranges between 6.9 to 8.4 indicating that ground water is slightly alkaline. This alkalinity

may be due to the presence of carbonates and bicarbonates ions.

The alkalinity in water is generally due to the dissolution of carbon dioxide in water [14]. In the present study the total alkalinity are varied in the range 310 to 605 mg/l.

The presence of high concentration of chloride in water is may be due to the pollution of water due to the presence of high organic waste of animal origin [15]. The concentration of chloride is in the range between 225 to 985 mg/l. The high concentration of chloride may effect the metabolism of body and increase the electrical conductivity of water [16]. The total dissolved solid values ranges between 513 to 1910 mg/l.

The property of water which prevents lather formation with soap and increases the boiling point of water is known as hard water [17]. The hardness causing cations are magnesium and calcium [14]. Hardness decreases the toxic effect of poisonous element [18]. Hardness make the water unfit for domestic and industrial use [19]. The hardness of water found in the range between 250 to 600 mg/l

4. CONCLUSIONS

Water is essential constituent for existence of life on earth and also for the human development and healthy functioning of ecosystem. The present study was undertaken with an aim to investigate certain physico-chemical parameters in the ground water samples in Aligarh City area. Most of the parameters analyzed have shown that they are within the permissible limits for drinking water. The pH value of the area ranges between 6.9 to 8.4 indicating low alkalinity of water. The water samples have significantly higher amount of TDS, they suggest possibilities of ground water pollution. It might be due to sewage or industrial source

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