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Short Communication

Study of Physico-Chemical Parameters of Ground Water around Badnapur, Dist Jalna

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ABSTRACT

Physico-chemical parameters of groundwater around Badnapur, Dist. Jalna were studied in November 2008. The parameters selected for the study are temperature, pH, total hardness, total dissolved solids, chlorides, sulphate, calcium, magnesium, turbidity, dissolved oxygen, etc.

Keywords: Physico-chemical parameters, ground water, Badnapur.

1. INTRODUCTION

Physico-chemical parameters are highly important with respect ot the occurrence and abundance of species. Discharge of urban, industrial and agricultural wastes have increased the quantum of various chemicals that enter the receiving water, which considerably alter their physico-chemical characteristics.In advanced life of present era, water has direct bearing on health of all the animals including man. Accountable reflection of quality of water in various sectors is the subject of interest of modern life. Advancement in technology has boosted the human population and also enhanced water use and simultaneously put burden on the existing water bodies to fulfill the industrial, agricultural and domestic use of water; which is said to be unending process of development. The present investigation deals with the study of physico-chemical parameters like temperature, pH, total hardness, total dissolved solids, chlorides, sulphate, calcium, magnesium, turbidity, dissolved oxygen, potassium, sodium and fluoride.

2. MATERIAL AND METHODS

Ground water samples from the Public borewell in Shankar Nagar, Badnapur-S1, Bore well situated in MHYCO far, Badnapur-S2, Bore well in St. Thomas Church, Badnapur-S3, Public Bore well at Jarhad Lane, Badnapur-S4, Public Bore well near Mukteshwar Mandir, Badnapur-S5 were selected for the study. The water samples were collected in the November 2008 in clean and rinsed plastic bottles of one litre capacity and transported to the laboratory. Laboratory pH and Field pH was measured using Griph-D pH meter model 327 with glass electrode. The electrode was calibrated against pH 7.0 buffer each time before measurement. The air temperature and water temperature were measured with hand-held mercury-in-glass thermometer. The conductivity was measured in the laboratory using a microprocessor controlled conductivity meter, model 306. The instrument probe was previously calibrated with 0.1 M KCl solution at 25°C. Turbidity of fresh water was measured in the laboratory using a Digital-Nephlo-Turbidity meter. The instrument was set up using ultra pure water as zero and respective range (0-1, 1- 10, 10-100 and 100-1000 NTU) of Farmazine solution. The Dissolved Oxygen (DO) in the sample was immediately fixed with 2 ml potassium iodide and 2 ml of manganous sulphate in the field itself. The DO content was determined by Winklers method. The remaining parameters were analysed by following standard methods given in APHA (1992) and Trivedy and Goel (1986).

3. RESULTS AND DISCUSSION

The temperature range was found between 26.9°C to 28.2°C which is within the range of WHO (1971). The pH ranges from 6.73 to 6.99 indicating slightly acidic nature. The electrical conductivity ranged between 1666.07µmhos/cm to 3224.95 µmhos/cm. The station S4 having low conductivity and station S2 has high conductivity indicating high ionic composition. The total dissolved solids found between 1350 ppm to 2720 ppm which is very higher than the permissible limit given by WHO (1971). The total alkalinity ranged between 352 ppm to 723 ppm having range higher than the permissible limit. Similar is the case with total hardness which ranged from 998 ppm to 2460 ppm.

The chloride content in the samples was ranged from 395.26 ppm to 1453.69 ppm which is again very high indicating the high content of salts in the ground water. The sulphate ranged from 21 ppm to 51 ppm which is well within

the desirable range. Calcium ranged between 96.19 ppm to 374.34 ppm. The station S2 has higher content of calcium. The range for magnesium was between 89.88 ppm to 219.24 ppm which is very much higher at all sampling stations. Sodium and potassium have near about constant and desirable range. The dissolved oxygen ranged from 5.87 ppm to 6.76 ppm. The turbidity of the water samples ranged between 1.94 NTU to 34.80 NTU. The lowest turbidity was at S4 and highest at S5. The fluoride content is within the permissible range with less than one ppm at all stations.

Table 1: Physico-chemical parameters of groundwater around Badnapur Dist Jalna

Water Quality Parameters	S1	S2	S3	S4	S5
Temperature °C	27.4	28.0	28.2	27.0	26.9
pH	6.73	6.73	6.76	6.99	6.82
Electrical conductivityμmhos/cm (EC)	2482.74	3224.95	2542.95	1666.07	2115.47
Total dissolved solids ppm(TDS)	2720	2560	2040	1350	1830
Total alkalinity ppm (TA)	508	352	360	582	723
Total Hardness ppm (TH)	2460	2380	1816	998	1180
Chloride ppm (Cl^-)	963.53	1453.69	687.73	395.26	480.70
Sulphate ppm (SO_4^{2-})	21.0	51.0	25.5	25.8	42.5
Calcium ppm (Ca^{2+})	264.52	374.34	192.38	104.20	96.19
Magnesium ppm (Mg^{2+})	219.24	176.12	162.72	89.88	114.49
Sodium ppm (Na^+)	35.85	35.75	35.00	25.05	35.35
Potassium ppm (K^+)	2.25	2.25	2.25	2.25	2.25
Dissolved Oxygen ppm (DO)	5.87	5.92	5.90	6.76	6.25
Turbidity NTU(TUB)	5.77	18.02	15.11	1.94	34.80
Fluoride ppm (F^-)	0.21	0.22	0.26	0.21	0.13

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