SHORT COMMUNICATION

WATER QUALITY PARAMETERS OF GROUND WATER NEAR INDUSTRIAL AREAS, SHRIRAMPUR (M.S)

A.G.Gadhave, D.G.Thorat and B.K.Uphade*

P.G.Department of Analytical Chemistry, P.V.P.College, Pravaranagar,
A/P-Loni (Kd).Tal.Rahata, Dist.Ahmednagar (M.S), India.
Email: bk_uphade@rediffmail.com

ABSTRACT

This paper presents quality of water samples from well in order to find out the magnitude of health problems in industrial areas, Shrirampur.The natural quality of ground water tends to be degraded by human activities. Six sampling points were selected for the study. The parameters studied were pH, Total hardness, chlorides, sulphates, Turbidity, TDS, total alkalinity, iron, copper, magnesium, sodium, potassium and calcium. The ion concentrations were expressed in mg/L.

***Key Words**: pH, total hardness, chlorides, sulphates, turbidity, TDS, total alkalinity, Fe, Cu, Mg,, Na, K, Ca, DO, COD and Polluted water samples.*

INTRODUCTION

The water quality undergoes rapid changes due to contamination. The quality of ground water is continuously changing as a result of natural and human activities. Water is polluted due to different phenomenon[1]. The dissolved solutes determine the usefulness of water for various purposes. Industrial water entering in to ground water is the major source of organic and inorganic pollutants. Due to rapid growth of industrialization, much sewage is disposed off that generates fair changes of ground water pollution. Safe drinking water is the primary need of every human being. All ground water sources are not always safe.Physico-Chemical characteristics of ground water of different parts of countries studied by many authors.[2-8]

EXPERIMENTAL

Water sample were collected in cleaned polythene container and preserved. pH value of ground water sample under investigation was measured using Elico pH meter Model No.LI-120. The pH was standardized by buffer of 4.0 pH and 9.2 pH.Total alkalinities of the water samples were determined by titrating with N/50 H_2SO_4 using phenolphthalein and methyl orange as indicators[9].The total hardness of the water sample were determined by complexometric titration with EDTA using erichrome black T as an indicators[9].The chloride ions were generally determined by titrating the water samples against standard solution of silver nitrate using potassium chromate as indicators[9]. Sodium, potassium and calcium were estimated using flame photometer techniques[10]. SO_4^{2-} and NO_3^- were estimated using UV-Visible spectrophotometers[9].EC values of the water sample under investigation were measured using Digital Coductometers Model-DI-909[10]. DO and COD of water samples were determined using titration method. The turbidity of the water samples were measured using Nephelo-turbidometry[10]. TDS of water sample were samples measured using gravimetric method. Metals Fe and Cu were estimated by titrating with potassium dichromate using sodium diphenyl sulphonate indicators and iodometric method respectively[9].

RESULTS AND DISCUSSION

The pH value of the water sample in the study area ranged from 7.90 to 8.90. The pH of water sample was slightly alkaline[11]. The total hardness of water sample is larger than desirable limit (300 mg/L)[12].The desirable limit for alkalinity is 200 mg/L the value of water samples varied from 180 mg/L to 304 mg/L.The chloride content of water sample varied from 102 mg/L to 162 mg/L.The sodium content of water samples varied from 96.3 mg/L to 230.7 mg/L in large concentration it may affect a person with cardia problems. The potassium content of water samples varied from 6.0 mg/L to 102.0 mg/L. The

calcium content of water samples varied from 42.0 mg/L to 82.3 mg/L.WHO permissible limit of calcium in the ground water is 100 mg/L. EC value of the well water samples in the study area varied from 1123 to 1526 micro mho/cm at 25 ^{0}C. The Dissolved Oxygen content of bore well water samples varied from 6.2 mg/L to 7.3 mg/L.The COD content of water samples in the range of 1.6 mg/L to 2.4 mg/L. The TDS content of water samples in the study area ranged from 420 mg/L to 630 mg/L[11].The NO_3^- content of water samples varied from 4.31 mg/L to 6.20 mg/L[11].The Sulphate value for water samples in the range of 14.5 mg/L to 36.0 mg/L[11].The turbidity content of water samples varied from 145 NTU to 200 NTU. Iron value varied 0.032 mg/L to 0.076 mg/L. Copper value varied between 1.24 mg/L to 2.06 mg/L. Magnesium value varied between 40.3 mg/L to 58.3 mg/L[11].

The analysis data suggest that, the water samples have large amounts of total hardness, TDS, total alkalinity and Sodium.

ACKNOWLEDGEMENT

The authors are thankful to the Management, Pravara Rural Education Society's and Principal, P.V.P.College Pravaranagar for providing necessary facilities in the department.

Table-1: Analysis data of well water samples from different locations.

Samples / Parameters	S_1	S_2	S_3	S_4	S_5	S_6
pH	8.40	8.30	7.90	8.90	8.80	8.90
Total Hardness (mg/L)	480	450	394	510	506	512
Alkalinity (mg/L)	240	180	195	304	272	189
Chloride (mg/L)	140	127	102	160	157	162
Sodium (mg/L)	195.6	180.4	96.3	210.4	230.7	180.2
Potassium (mg/L)	6.0	20.4	102.0	98.4	86.0	70.2
Calcium (mg/L)	46.0	42.0	75.6	72.3	82.3	52.4
EC (micromhos/cm)	1245	1142	1356	1526	1123	1356
DO (mg/L)	6.2	7.3	6.6	7.2	7.4	6.9
COD (mg/L)	2.4	2.0	1.6	1.9	2.0	1.8
TDS (mg/L)	420	550	402	570	630	490
NO_3^- (mg/L)	4.31	5.30	4.50	6.20	5.70	6.20
SO_4^{2-} (mg/L)	23.6	14.5	19.0	36.0	16.0	23.6
Turbidity (NTU)	145	160	190	170	200	180
Fe (mg/L)	0.032	0.046	0.076	0.052	0.062	0.052
Cu (mg/L)	1.56	2.06	1.90	1.85	1.24	1.46

REFERENCES

1. S. Sharma, *Asian J.Chem*, **16**, 309 (2004).
2. S.B.Koshatwar, S.T.Taide and S.E.Bhanarkar, *Int.J.Chem.Sci*, **5 (2),** 655 (2007).
3. H.R.Aher, D.G.Zinjad, P.S.Gunjal and S.R.Kuchekar, *J.Chem.Envi.Res*, **11 (1 and 2)**, 101 (2002).
4. Naveen Kumar Singh and D.S.Kadam, *Int.J.Chem.Sci*, **5 (2)**, 2007, 549-554.
5. P.R.Bhagat, *Rasayan.J.Chem*, **1 (1),** 195 (2008).
6. Rani D.F.G, Geeta S and Ebanazar, *J.Poll.Research*, **21**,215 (2002).
7. S.Chaturvedi, Dinesh Kumar and R.V.Singh, *Res. J.Chem.Environ.*, **7 (3)**, 78 (2003).
8. H.Avci, I. Akdeniz and M, Yaman, *Asian J.Chem*, **20 (4),** 2827 (2008).
9. A.I.Vogel, "A Text Book of Quantitative Inorganic Analysis", Third Edition, Longmans, London (1961).pp.266, 358, 372, 438 and 806.

10. S.W.Rajbhoj and T.K.Chondekar, Systematic Experimental Physical Chemistry, Anjali Publication, Aurangabad (2000). pp.231.
11. World Health Organization (WHO), International Standards of Drinking water, Geneva (2004). pp.53-79.
12. Indian Standard Drinking Water Specification (ISI), New Delhi, **5** (1991). pp.-16.

(Received: 11 April 2008 Accepted: 18 October 2008 RJC-177)