International Journal of Chemical Studies

P-ISSN2349–8528
E-ISSN 2321–4902
IJCS 2016; 4(4): 139-141

Received: 21-05-2016
Accepted: 23-06-2016

Piyush M Maurya
Assistant Professor & Head,
Department Of Chemistry,
Shri J.J.T. University,
Jhunjhunu, Rajasthan, India.

Correspondence
Piyush M Maurya
Assistant Professor & Head,
Department Of Chemistry,
Shri J.J.T. University,
Jhunjhunu, Rajasthan, India.

Degradation of Water Quality Due to Heavy Pollution in Industrial Area of Sultanpur, Uttar Pradesh

Piyush M Maurya

Abstract
The existing investigation were undertaken to study chemical & bodily properties of Effluents discharged from Sultanpur business vicinity. Industrial waste if discharged into floor water can provide rise to big deterioration in its fine. This paper gives groundwater quality of Jagdishpur business area in Sultanpur city. Six specific places had been selected for the examiner and as compared. The parameters studied had been pH, total alkalinity, total hardness, turbidity, chloride, sulphate, fluoride, overall dissolved solids and conductivity. From universal evaluation, it became located that there has been a mild fluctuation in the physico-chemical parameters most of the water samples studied. Assessment of the physico-chemical parameters of the water pattern with WHO and ICMR limits confirmed that the floor water is extraordinarily infected and account for health hazards for human use.

Keywords: Heavy pollution, Water quality, Sultanpur area

Introduction
Water pollution is a major global hassle which calls for ongoing assessment and revision of water aid coverage at all stages (worldwide down to character aquifers and wells). It has been cautioned that it's far the leading global purpose of deaths and diseases, and that it accounts for the deaths of extra than 14,000 humans daily. An estimated 700 million Indians haven't any get right of entry to a right rest room, and 1,000 Indian youngsters die of diarrheal illness each day.[1] a few 90% of towns suffer from some diploma of water pollution and nearly 500 million people lack get entry to safe drinking water. Similarly to the intense issues of water pollution in growing countries, evolved international locations keep to warfare with pollution issues as nicely. The particular contaminants main to pollutants in water encompass a wide spectrum of chemical substances, pathogens, and physical or sensory changes inclusive of multiplied temperature and discoloration. At the same time as most of the chemical substances and substances which are regulated can be certainly happening (calcium, sodium, iron, manganese, and so on.) the concentration is often the key in figuring out what's an herbal element of water, and what's a contaminant. Excessive concentrations of obviously-taking place materials could have poor impacts on aquatic plants and fauna.
Oxygen-depleting substances may be natural substances, such as plant rely (e.g. leaves and grass) as well as man-made chemical compounds. other herbal and anthropogenic materials can also motive turbidity (cloudiness) which blocks mild and disrupts plant boom, and clogs the gills of some fish species.[2] a few of the chemical materials are poisonous. Pathogens can produce waterborne sicknesses in both human and animal hosts. [3] Alteration of water's bodily chemistry consists of acidity (change in pH), electric conductivity, temperature, and eutrophication. Eutrophication is an increase inside the attention of chemical nutrients in an ecosystem to an quantity that increases within the primary productiveness of the ecosystem. Depending at the degree of eutrophication, subsequent poor environmental outcomes inclusive of anoxia (oxygen depletion) and excessive discounts in water satisfactory may also arise, affecting fish and other animal populations.

Study Area
Jagdishpur business area is a part of Sultanpur Distt. Situated at 82°fifty three'forty two"E Longitude and 25°44'fifty eight"N latitude with the 304.8 meter above sea stage. Underground water is the most effective supply of water for the economic areas of Sultanpur the groundwater first-class of Sultanpur is continuously degrading because of industrial activities

and the soils of the nearby fields are also being affected. Therefore, we have decided to analyze its effluents so that some treatments for the improvement could be feasible. Fig.1 suggests the observe location and sampling locations.

Material and Method

Effluents samples had been collected from ten one-of-a-kind places of Sultanpur business location at some point of the post-rainy season (Oct-Nov 2015). Borosilicate glassware, distilled water and properly first-rate reagents had been used at some point of the testing. Samples were collected in sterilized screw-capped polyethylene bottles of 1 liter potential and analyzed in laboratory for his or her physico-chemical parameters. Samples amassed from observe web sites have been properly categorized and a report became prepared (table 1). The diverse physiochemical parameters were analyzed (table 2) and health outcomes of chemical parameters are stated (desk three). Overall alkalinities of the water samples have been decided through titrating with N/50 H_2SO_4 the usage of phenolphthalein and methyl orange as signs. The chloride ions were generally decided with the aid of titrating the water samples towards a popular solution of $AgNO_3$ the usage of potassium chromate as a trademark. The conductivity of the water pattern was measured using the conductometry method. The total hardness of the water samples changed into determined by way of complexometric titration with EDTA the use of Erichrome balck-T as a trademark. Sulphate and fluoride of the water samples have been expected via UV-seen spectrophotometer. TDS of water sample were measured the usage of gravimetric method.

Table 1: Sampling points

Sampling place	Sampling point number
BHAIL	1
SUGAR MEEL (E)	2
SUGAR MEEL (W)	3
River Hasdeo up steam	4
RiverHasdeo Barrage	5
River Hasdeo Down steam	6

Table 2: Methods used for estimation of various physicochemical Parameters

Parameters	Method
Temperature	Thermometer
pH	pH meter
Total Alkalinity	Conductometry
Total Hardness	EDTA Titration
Turbidity	Turbidity Meter
Chloride	Silver nitrate Method
Sulphate	Turbidometric Method
Fluoride Ion	spectrophotometer
Total Dissolved Solids	Conductivity Meter
Conductivity	Conductometry

Table 3: Health effects of chemical parameters

Parameters of water analysis	BIS Guideline values (Max. allowable)	Potential health effects
pH	6.5-8.5	Affects mucous membrane; bitter taste; corrosion
Total Alkalinity	600mg/l	Boiled rice turns yellowish
Total Hardness	600mg/	Poor lathering with soap; deterioration of the quality of clothes; scale forming
Chloride	1000mg/l	Taste affected; corrosion
Sulphate	400mg/l	Taste affected; gastro-intestinal irritation
Fluoride	1.5mg/l	Dental and skeletal fluorosis; non-skeletal manifestations
Total Dissolved Solids	200mg/l	Undesirable taste; gastro-intestinal irritation; corrosion or incrustation

Table 4: Physico-chemical parameters of sampled waters

Parameters	Sampling point					
	1	2	3	4	5	6
Temperature (0C)						
pH	8.12	8.93	8.46	7.89	8.10	7.90
Total Alkalinity (mg/l)	94	96	92	115	100	95
Total Hardness (mg/l)	100	94	87	92	84	96
Nitrate (mg/l)	1.12	1.21	0.96	0.8	1.34	1.2
Chloride (mg/l)	114	124	96	95	86	15
Sulphate (mg/l)	60	68	45	72	54	60
Fluoride (mg/l)	0.86	1.0	1.13	1.15	0.95	1.11
Total Solids (mg/l)	560	600	579	570	475	528
BOD	14	18	8	14	10	5

Result and Discussion

The pattern gathered from Sultanpur commercial area becomes analyzed. The analysis (table 3) of floor water samples includes the dedication of awareness of inorganic ingredients. The physico- chemical parameters, which had been analyzed in publish monsoon season Oct- Nov 2015, had been shown in table 4. The applicable pH variety necessary for drinking water is from 7. zero to eight. nine. The pH value of water pattern inside the take a look at location ranged from 7.89 to eight.93. On a median, pH of all samples turned into in suitable restriction as prescribed for drinking water fashionable. This indicates that pH of water pattern turned into slightly alkaline. Overall alkalinity of water in terms of $CaCO_3$ varied from ninety two- 115mg/l. The values of general alkalinity were relatively slight. The water for domestic use having alkalinity much less than 100mg/l is secure. The high content material of alkalinity is proven inside the desk 4. General hardness became discovered inside the sample water ranges from eighty four-100mg/l, which shows that water is safe for drinking purpose. Hardness has no acknowledged unfavorable consequences on health. But, most permissible stage prescribed with the aid of WHO for ingesting water is 500 mg/ asset. in keeping with a few classifications, water having hardness up to 75mg/l is classed as tender, seventy six-one hundred fifty mg/l is reasonably gentle, 151- three hundred mg/l as difficult (Dufor & Becker,1964) and greater than three hundred mg/l as very tough. On this foundation, the results show that each one the samples had been smooth except sample 01 (Ravisankar & Poogothai 2008). Chloride content of the water samples became low in rainy season. In keeping with WHO, most permissible limit for chloride is 500mg/l. The value located in present study is in the range of permissible restriction (Ravisankar & Poogothai, 2008) (Fig. three). The sulphate content material varies between 45 to 72 mg/l and the fluoride content varies between 0.86 to one.15 mg/l. The sulphate and fluoride values have been additionally discovered to be in the

prescribed limits. general dissolved solids (TDS) is a measure of the blended content material of all inorganic and organic materials contained in a liquid in molecular, ionized or micro granular suspended shape. The permissible restrict of TDS of drinking water is 500 mg/l (WHO, 2004). The observation indicates that the TDS is within the permissible range as prescribed by using WHO (2004).

Conclusion

The results of water research display that the waters of the have a look at location are enormously contaminated with total solids. As a result of excessive concentration of TS, water loses its portability and decreases the solubility of oxygen in water. Water of almost all examine points is hardened infected due to this, people of Sultanpur area are prone for the immediate fitness issues which includes stomach illnesses, gastric issues and many others.

Acknowledgement

I'm thankful to Dr. V.K. Singh partner professor and Head branch of chemistry Ganpat sahai submit graduate college, Sultanpur, Uttar Pradesh for assisting important substances during the evaluation.

References

1. APHA, Standard methods for examination of water and waste water 19th edn. American Public health association, Washington, DC., 1995.
2. BIT, Drinking water specification (First revision), I. S. 10500, 1995.
3. Tiwari RK, Goel PK. chemical and Biological method for water pollution studies, Environmental Publication, Karad India, 1986.
4. Aruna Sharma, Khan TI. Organo –chlorine pesticides in irrigation water Jaipur city (India) Central Public Health and Environmental Engineering organization. Manual on water supply and Treatment, Ministry of works and housing New-Delhi.
5. Sorg IJ. Treatment technology to meet the primary drinking water regulation for inorganics (part-1) (q). J Amwat works astt. 1998; 70(2):105-112.
6. Singh V, Chandel CPS. The portability of groundwater in terms of Water Quality Index (WQ1) of Jaipur city. Cheml. Environ. Res. 2004; 13(3&4):307-314.
7. ICMR-Indian council of medical research, New Delhi manual of quality of drinking water supply special report series no -44, 1975.
8. Manual on water and waste analysis NEERI Publication, 1988
9. Journal of environmental science and engineering., 2008, 175-178.