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STUDIES ON TEXTILE-DYEING EFFLUENT FROM BHIWANDI CITY, DIST: THANE, MAHARASHTRA, INDIA

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ABSTRACT

This paper is an attempt to analyze the water quality of the effluents from the Textile –Dyeing industry. In this investigation the physico-chemical parameters such as pH, TSS, BOD, COD, Oil and Grease, A.B.S, Residual Chlorine and Ammonical Nitrogen were analyzed for the period of 16 months. The analysis was carried out before and after treatment of the effluent with an objective to investigate the efficiency of effluent treatment process.

INTRODUCTION

Much of the current concern with regards to the environmental quality is focused on water because of importance in maintaining the human health and the ecosystem. The consequences of urbanization and industrialization are sever water pollution. The addition of various kinds of nutrients and pollutants through the sewage, industrial effluents, agriculture run off etc. into water bodies bring about a series of changes in physico-chemical characteristics of water.

Bhiwandi is centrally located in Thane district. It is situated at latitude 73.0°N and 19.20°E. Geographically Bhiwandi is a part of Northern Konkan region. It is spread over 26km (2635.93 Hecters) area, situated on the bank of Kamvari river and on Bhiwandi creek. Its economic importance is in being textile industrial hub.

There are more than 5 lacs power looms, more than 225 dyeing, printing, processing units in Bhiwandi. Out off these 225 units, 45 units are Dyeing and printing units which carry out the printing work on clothes on a large scale. The wastes from these textile dyeing industries are darkly coloured. The colour of waste depends upon type of dye used for dyeing process. The waste outlets of these industries are directly let through drainage channels into the nullah and further into the Kamvari river which finally leads to Bhiwandi creek.

Hence, monitoring of the effluent treatment plant in these industries is essential. In the present work, an attempt has been made to study the efficiency of effluent treatment plant in one of the renowened Textile - Dyeing Industry.

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MATERIALS AND METHODS

RESULT AND DISCUSSION

Effluent samples from the Textile-Dyeing industry in Bhiwandi were collected every month during the study period Jan 2010 to April 2011. The samples were collected in plastic carboys, transported to the laboratory and stored at 4°C till the analysis was completed. The effluent samples were analyzed for different parameters recommended by Maharashtra Pollution Control Board (MPCB). Analysis of the effluent was carried out using standard procedures as per APHA, AWWA, WCPF (2004). The results are summarized in Table 1.

pН

pH is one of the important factors that serves as an index for pollution. The factors like disposal of industrial water and domestic sewage affect pH. It is therefore necessary to evaluate effluent with respect to the pH value (David & Ray, 1970). In the present study the pH of untreated effluents was in the range 7.9 to 9.5 where as that of treated effluent was 7.0 to 7.4.

Table 1. Physico-chemical parameters of Untreated adnd treated industrial effluents.

Parameters		pН	TSS	BOD 27°C	COD	Oil &	A.B.S Re	esidual Am	monical
				3days	(mg/L)	grease	(Detergent)	Cl ₂	N ₂ (TAN)
				(mg/L)		(mg/L)	(mg/L)	(mg/L)	(mg/L)
Jan-10	Untreated	8.7	180	226	790	4.9	4.6	3.1	4.8
	Treated	7.4	78	82	264	3.1	2.4	1.6	3.1
Feb-10	Untreated	9.5	158	180	816	3.2	2.6	2.8	3.8
	Treated	7.1	64	80	240	2.5	1.9	1.1	2.5
Mar-10	Untreated	8.6	184	176	760	3.8	2.8	2.6	4.1
	Treated	7.2	82	70	252	2.4	1.5	1.2	2.7
April-10	Untreated	9.1	164	158	614	3.4	2.3	2.3	3.5
	Treated	7.4	77	62	264	2.1	1.2	1.1	2.2
May-10	Untreated	9	144	164	568	2.1	2.4	2.1	5.2
	Treated	7.2	74	72	260	1.2	1.0	0.7	3.1
June-10	Untreated	8.9	184	192	718	3.2	2.91	1.4	6.2
	Treated	7.0	77	84	262	1.9	1.8	0.8	1.0
July-10	Untreated	8.4	174	188	658	3.8	3.4	2.1	4.8
	Treated	7.3	84	6	254	1.4	1.5	1.1	1.2
Aug-10	Untreated	7.9	190	14	548	4.0	2.9	1.9	6.4
	Treated	7.4	62	68	252	1.7	1.8	0.5	3.6
Sep-10	Untreated	8.9	172	186	660	3.5	3.2	1.6	5.8
	Treated	7.1	8	82	262	1.4	2.1	1.0	3.4
Oct-10	Untreated	8.2	180	168	16	3.9	2.4	1.4	3.9
	Treated	7.3	84	6	254	2.1	1.1	0.9	2.6
Nov-10	Untreated	8.9	128	220	60	3.2	2.0	1.9	5.6
	Treated	7.2	76	620	2.4	1.6	1.6	1.2	4.2
Dec-10	Untreated	9.2	148	188	588	4.2	2.6	1.5	4.8
	Treated	7.3	88	78	244	1.8	1.3	1.1	3.1
Jan-11	Untreated	9.4	186	160	786	2.6	4.0	2.3	4.4
	Treated	7.1	49	72	260	1.9	1.6	0.9	2.6
Feb-11	Untreated	9.1	162	188	668	3.2	4.4	2.1	5.2
	Treated	7.3	62	78	252	1.6	2.1	1.0	2.5
Mar-11	Untreated	9.1	160	182	220	2.6	3.0	1.3	5.4
	Treated	7.8	75	86	236	2.0	1.8	0.9	4.0
April-11	Untreated	9.0	124	144	512	3.8	4.1	1.9	4.9
	Treated	7.0	68	72	260	2.3	1.9	0.3	3.2

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Biochemical Oxygen Demand (BOD)

In the present study the untreated effluent BOD was 158.00 mg/L to 226.00 mg/L. The treated effluent showed BOD value in the range of 62.00 mg/L to 84.00 mg/L.

Chemical Oxygen Demand (COD)

The COD of untreated effluent was in the range of 548.00 mg/L to 816.00 mg/L. The treated effluent showed COD values in the range 204.00 mg/L to 264.00 mg/L.

Total Suspended Solids (TSS)

In the present study total suspended solids of untreated effluent were maximum 192.00 mg/L and minimum 128.00 mg/L. The treated effluent showed values of total suspended solids maximum 84.00 mg/L and minimum 49.00 mg/L.

Oil and Grease

In the present study the oil and grease present in the untreated effluent was 2.1 mg/L to 4.9 mg/L, where as the treated effluent showed the range 1.4 mg/L to 3.1 mg/L.

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Table 2. MPCB Limits for effluents.

Sr. No	Parameters	Limits
1.	pН	6 to 8.5
2.	Total Suspended Solids (TSS)	>100 Mg/L
3.	BOD 27°C, 3 days	>100 Mg/L
4.	COD	>250 Mg/L
5.	Oil & Grease	>10 Mg/L
6.	A.B.S (Detergent)	>50 Mg/L
7.	Residual Cl,	>2 Mg/L
8.	Ammonical N ₂ (TAN)	>1 Mg/L

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