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Physico-Chemical Analysis of Triveni Sugar Mill (Ramkola)

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Abstract: ***This analysis was done for getting the knowledge of physical and chemical properties of water that is coming out from the sugar mill which is located in Ramkolakushinagar, U.P. Further we observed that the treated water we obtained from ETP is suitable for agricultural irrigation process and also gives good result. That all comes by maintaining the values of parameters of physical and chemical properties like COD, BOD, pH, TSS, DO etc.***

Keywords: sugar mill effluents, BOD, COD, Odour, pH, TSS

1. Introduction

Another name of sugar mill is sugar refinery that produces sugar crystals or white sugar from sugar cane. In Utter Pradesh,India sugar mill is a key factor in rural economy.Sugar mill is one of the most important agro based industry in India. India is the largest sugarproducerin the world. The sugar millsplays an important role in India's economy. It is the second largest industry in the country, next to textiles and provides employment to more than 3.6 lakes employees. The cultivation and transportation of sugarcane to the sugar mills provides a source of income to large number agriculturer, technicians, and transport operators .The main final products of sugar cane mill are crystalline sugar .The water nature for irrigation purpose is crucial for maintaining soil quality. Therefore nature of water used for irrigation can be tested by its physico-chemical analysis. Chemical characteristics of water are important parameters to assess the suitability of water for agriculture purpose. The concentration and composition of soluble constituents in water determine its suitability for its use in agriculture.

2. Study Area

The present research is about the physico-chemical analysis of sugar industry effluents of Cooperative Sugar Mills, ramkolakushinagar, India. It is located at 26°54'N 83°50'E. Sugar mill effluents (SME) samples were collected for analyzing for various parameters.

pH (Hydrogen Ion Concentration)
It is observed that the pH of the water coming out frommill to ETP is below 7 means acidic hence it is controlled andfinal value should be above 7 so that it contains the property of non acidic**.**

BOD
Biological oxidation is a slow process and organic matter is decomposed by micro-organisms into carbon dioxide and water using dissolved oxygen. Hence, value of DO is decreasing and increasing measure of BOD. BOD is an important parameter to show the magnitude of water pollution. In laboratory distilled water is kept under air machine for 2 to 20 hrs, after MLSS water is taken 10 ml in 2 ltr distilled water,third 4 chemicals each of 2ml is mixed which are MgSO4,FeCl3,CaCl2,and phosphate buffer. Taken different bottles blank inlet and outlet .Inside DO will find at spot At last is kept at 27degree celcius for 3 days. The outlet value must be below 20.

Chemical Oxygen Demand (COD)
COD is an important test used for measure the pollution of domestic and industrial waste. COD and BOD test collectively are used to indicate the level of toxic conditions of any types of water body. The last outlet value should be maintained below 250.

TSS
TSS of a water or waste water sample is determined by pouring a carefully measured volume of water (typically one litre, but less if the particulate density is high, or as much as two or three litres for very clean water) through a pre-weighed filter of a known pore size, then weighing the filter again after the drying process that removes all water on the filter. The value should previously come above 600 but after that final value should maintain between 10 to 30 according to parameters given by delhi pollution board.

DO (Dissolved Oxygen)
This measurement is a relative measure of concentration of oxygen that are dissolved or carried in a given medium as proportion of highest concentration that can be dissolved in that medium. To find this MnSO4 and alkaliazide both of 2ml is added in sample and after settling 2ml H2SO4 of 98% concentration is added in 203 ml sample taken again add starch in it while its colour becomes blue, then titration takes place. Titration takes place with sodium thiosulphate and when it becomes colourless the reading is Dissolved oxygen.

3. Result and Discussion

Physico-chemical properties of sugar industry effluents and their values are shown in Table 1

Table 1: Calculation result

Parameters	*Ph value*	*BOD*	*COD*	*TSS*	*Oil grease*
Outlet Concentration range	7-8.5	0-30	0-250	0-30	0-10
Initial Value	1) 5.02 2) 4.50 3) 6.20 4) 4.89 5) 5.38	390 350 392 380 350	3142 6922 3076 5475 5478	600 680 680 800 760	24.2 28 52.12
Final Value	1) 7.80 2) 7.55 3) 7.70 4) 7.89 5) 7.66	16 9 14 12 08	115 138 146 174 158	4 8 12 16 15	8.2 10 7.8

4. Conclusion

In this sugar mill the water treated in ETP which goes under several steps are collected in a big lagoon and is collected and used for several different processes inside mill and for agriculture can also be used for drinking water for whole village only by installing large RO instead of carbon and sand filter.

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