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Smartiot Frame Work Forreal-Timeplant Disease Analytics and Soil Nutrient Optimization

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ABSTRACT: Wastewater treatment processes are designed to achieve improvements in the quality of the wastewater. Environmental management, wastes recycling, treatment and disposal, pollution control and prevention and wastewater reuse became the most important issues and in the top of the global warming. Waste water usually can be processed for disposal or recycling by one or more steps.. Oily wastewater pollution is mainly manifested in the following aspects:(1) affecting drinking water and groundwater resources, endangering aquatic resources; (2) endangering human health;(3) atmospheric pollution; (4) affecting crop production; (5) destructing the natural landscape, and even probably because of coalescence of the oil burner safety issues that arise. Given oily wastewater pollution background China provides the maximum allowable emission of oily wastewater concentration of 10 mg/L. The operation the various treatment processes may reduce:Suspended solids (physical particles that can clog rivers or channels as they settle under gravity)

KEYWORDS: Smart IoT, Wastewater Treatment, Oily Wastewater, Zeolite Filtration, Soil Nutrient Optimization, Water Quality Analysis, Environmental Monitoring

I. .INTRODUCTION

Primary (mechanical) treatment is designed to remove gross, suspended and floating solids from raw sewage. It includes screening to trap solid objects and sedimentation by gravity to remove suspended solids. This level is sometimes referred to as “mechanical treatment”, although chemicals are often used to accelerate the sedimentation process. Primary treatment can reduce the BOD of the incoming wastewater by 20-30% and the total suspended solids by some 50-60%. Primary treatment is usually the first stage of wastewater treatment. Many advanced wastewater treatment plants in industrialized countries have started with primary treatment, and have then added other treatment stages as wastewater load has grown, as the need for treatment has increased, and as resources have become available.

- Secondary (biological) treatment removes the dissolved organic matter that escapes primary treatment. This is achieved by microbes consuming the organic matter as food, and converting it to carbon dioxide, water, and energy for their own growth and reproduction. The biological process is then followed by additional settling tanks (“secondary sedimentation", see photo) to remove more of the suspended solids. About 85% of the suspended solids and BOD can be removed by a well running plant with secondary treatment. Secondary treatment technologies include the basic activated sludge process, the variants of pond and constructed wetland systems, trickling filters and other forms of treatment which use biological activity to break down organic matter

Waste water treatment

- Tertiary treatment is simply additional treatment beyond secondary! Tertiary treatment can remove more than 99 percent of all the impurities from sewage, producing an effluent of almost drinking-water quality. The related technology can be very expensive, requiring a high level of technical know-how and well trained treatment plant operators, a steady energy supply, and chemicals and specific equipment which may not be readily available. An example of a typical tertiary treatment process is the modification of a conventional secondary treatment plant to remove additional phosphorus and nitrogen

Sources of Waste Water

- Waste water was used as feed in this study. We are choosing the car wash water for treatment and reduce oil and grease from car wash water due to further treatment process. It was collected from car workshop. The sample then kept in a cold room at temperature of 4°C to avoid further biodegradation. When cars are washed by hand much more fresh water is used than in a washing plant. Because industrial water in a car washing installation can be microbiologically contaminated, both the personnel and the customer must be protected against a possible health endangerment. This is

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particularly the case, when the contaminated washing water is sprayed in closed areas. People can inhale aerosols that are formed and this can cause infection with possibly dangerous bacteria

Effects Of Waste Water

- pH- Affects mucous membrane; bitter taste; corrosion; bitter taste; corrosion;affects aquatic life
- Total Alkalinity-Low Alkalinity (i.e. high acidity) causes deterioration of plumbing and increases the chance for many heavy metals in water are present in pipes, solder or plumbing fixtures.
- Hardness - Scale in utensils and hot water system, soap scums
- Calcium - Poor lathering and deterioration of the quality of clothes; incrustation in pipes; scale formation

SampleCollection

- The water sample is collected from car workshop, perambalur. To understand the environmental impacts of industrial effluents irrigation, effluent mixed with water and ground water. The effluent from the car wash water is dark brown in colour and contain oil and grease

Experimental Setup

FIGURE 1

Experimental Procedure For Parameters

- **pH**

The pH is determined by using Ph meter. The instrument must be standardized by using buffer. The platinum electrode of PH meter is immersed in the water sample for 5-10 seconds. The PH of the sample is shown in the display of the water.

Turbidity

- Turbidty is an optical determination of water clarity. The turbidity of the sample is analyzed by using Nephlo turbidity meter.set the Nephelometer to ‘0’ and ‘100’ readings using double distilled water ‘100’ NTU standard. A distilled water is used and set zero by adjusting the switch before the sample is analyzed. The turbidity of the sample is shown in the display of the meter

Hardness

- The total hardness of the sample is determined by titrating hard water with EDTA in the burette. The EBT indicator and standard buffer is addad as reagents. Permanent hardness is determined by titrating the boiled water instead of hard water and the same procedure of total hardness is followed. Strength of EDTA is to be prepared with 0.01N

Chlorid

- The chloride ion concentration is found by standardizing AgNo3 against standard sodium chloride. The water sample is titrated with silver nitrate in the burette until yellow changes to brick red. Indicator of the titration is potassium chromate.

Sodium

- It is measured with the help of flame photometer. The instrument is standardized with the known concentration of sodium ion (1 to 100 mg/litre). The sample having higher concentration are suitably diluted with distilled water and the dilution factor is applied to the observed values. In the dual channel flame photometer, select the filter for sodium. Set the flame photometer to `0` reading in both channels. Standardize the photometer.verify the ‘0’ reading for the sample.

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Then measure the meter reading for the samble in both channel. If the meter reading exceeds '100' for Na/K/both Na and K , dilute the samble and take the reading in that channel in which more than '100' reading was noted.

Introduce control standard and record the meter in both channel.

Biochemical oxygen demand (BOD)

- BOD is the amount of dissolved oxygen required for the biochemical decomposition of organic compounds and the oxidation of certain inorganic material (e.g., iron, sulfites). Typically the test for BOD is conducted over a five-day period. Place required volume of distilled water in a bottle and add 1ml each of phosphate buffer, magnesium sulphate, calcium chloride and ferric chloride solutions per liter of water. Prepare dilutions either in graduated cylinder or volumetric flask, mix well with a plunger type mixing rod, siphon mixed dilution into two BOD bottles without any entrapment of air and stopper the bottle. Take aerated distilled water in another two BOD bottles without entrapment of air and stopper the bottle as blank. Determine the initial dissolved oxygen on one of these two bottle for sample as well as blank. Stopper the second bottle of both sample and blank, water seal and incubate for5 days at 20◦C in BOD incubator. After 5 days incubation period, determine of dissolved oxygen.

II. TREATMENT PROCESS

Flocculation

- It is process by which the floccules, that are formed after flash mixing of waste water with or chemical coagulants.The mechanical flocculation without addition of chemical coagulant.

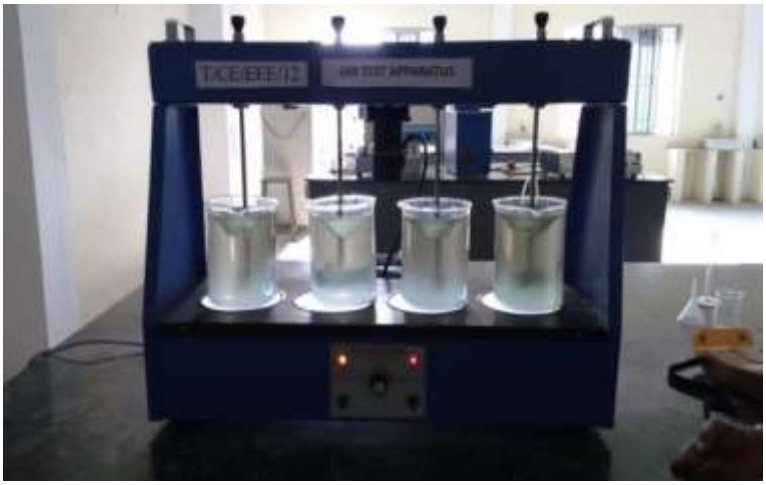

FIGURE 2

Skimming tank

- The skimming tank in which as waste water flows air blown by aerating device through the bottom of the tank. The tank is remove grease material and causes it to rise to the surface and push it to side from where it is removed.
-

FIGURE 3

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Table: SKIMMING RESULT

Removal matter	**Efficiency**
suspended solid	**69.2%.**
Oil	**81.4%,**

Flotation together tothe tower separation system oily wastewatertreatment, to obtain high oil–water separation efficiency

Zeolite process

- The zeolite add into effluent after come out from skimming tank. Zeolite is destabilize the oil from waste water. To add 500mg amount of zeolite powder in the 5 litres of effluent. This method is effective, because sorption process(mesoporous) of waste water treatment. Add zeolite in the effulent to
- start the stirring upto 120 times for effectiveness. The waste water was no any disturb by experiment upto 4 hours. After 4 hour the remain oil content is destabilized .The oil content is floating on waste water and disposed by absorption sheets. The oil removal of water is fed into the next treatment.

FIGURE 4

(TREATED BY ZEOLITE FILTERATION)

The final step of our project is filteration process. The filteration process done after treatment of charcoal. The samples were filtered using 0.45µm filter paper.

FIGURE 5

III. TEST ANALYSIS

GENERAL

- This chapter deals about the characterstics of various parameters such a PH, turbidity, alkalinity, electrical conductivity , calcuim, BOD, COD, magnesium, sodium, nitrate, and ammonia, phosphate and etc.,,

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3.2 TEST RESULTS

PH ANALYSIS

Parameter	Before treatment	After treatment
PH	7.01	7

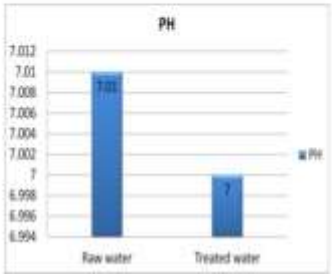

FIGURE 6

PH ALKALINITY as $CaCo_3$

Parameter	Before treatment	After treatment
PH Alkalinity	0	0

FIGURE 7

TOTAL ALKALINITY as $CaCO_3$

Parameter	Before treatment	After treatment
Total Alkalinity	288	300

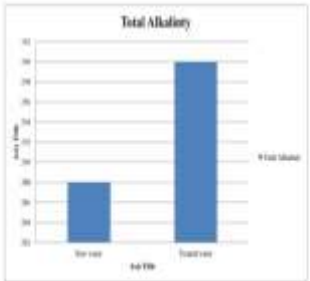

FIGURE 8

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TIDYS TEST 4hrs AS O_2

Parameter	Before treatment	After treatment
TIDYS TEST	624	270

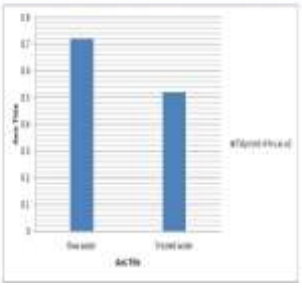

FIGURE 9

FREE AMMONIA

Parameter	Before treatment	After treatment
Free Ammonia	16.54	0

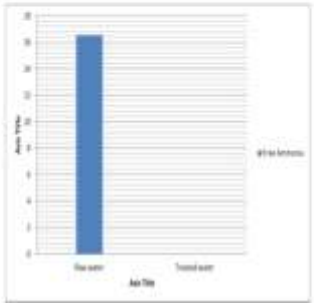

FIGURE 10

FIGURE 11

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IV. REMEDIAL ACTION

INTRODUCTION

- From the analysis, it is found that the water samples contains large amount of sulphate , magnesium , BOD,COD, heavy metals and potassium values. To treated the waste water hence, total solids content, ammonia ,heavy metals, COD,BOD, potassium is significantly to be reduced.

- After the purification process, we purified the car wash water

BEFORE WASHING:

FIGURE 12

AFTER WASHING:

FIGURE 13

V. CONCLUSION

The development and maintenance of safe water supplies is the availability and use of efficient, inexpensive, and appropriate technology for removing microbial hazards, parasites, and toxicants. This filter was evaluated for its ability to remove parasitic cysts and toxicants as well as bacteria. The chemical content present in the raw water like Aluminum, Zinc, Chloride and oil and grease,Manganese, Fluoride, Iron, and pH etc., and physical properties like Colour, Odour and Turbidity were tested for both Raw water as well as the treated water. The result of the treated water was found out can satisfy the same properties as like the standard water content. So this zeolite can remove the chemicals that are harmful to the human being in a great extent and gives pure water. After that treatment of waste water is reused to domestic oriented of clothes washing.

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