

Low Cost Treatment to Automobile Waste Water Service Centre

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Abstract

In India the vehicles are increasing day by day, in these vehicles the maximum number is occupied by two wheelers at the same time the service center for maintenance of these vehicles also increases. The activities done in service center generate waste water which includes oil and grease. These oil and grease are organic matter and also biodegradable but it takes more time to naturally degrade and separate out from water. That oil forms a layer on surface of water. In STP there is a skimming tank provided to separate out the oil from water, but this method is also not suitable for longer time as the oil gets clogged in skimming tank and other units of STP. It is difficult to clean, maintain and to run the units. Hence there is a need to remove the oil and grease at source itself. Adsorption technique is an effective method for removal of oil and grease from source. Corn cobs are the agricultural waste material used for the adsorption technique. In this technique adsorbate are cobs. The experiment is carried out by considering different parameters 1) flow rate 2) dose 3) contact period 4) length of channel. The efficiency of removal of oil and grease is up to 70% to 80%.

Keyword- Service Centre Waste Water, Adsorption Process, Agricultural Waste

I. INTRODUCTION

Organic toxic waste (oil and grease (O&G)) causes ecology damages for aquatic organism, plant, animal, and equally, mutagenic and carcinogenic for human being they discharge from different sources to form a layer on water surface that decreases dissolved oxygen. Then oxygen molecules are difficult to be oxidative for microbial on hydrocarbon molecules and cause ecology damages to water bodies, toxicity to the aquatic organisms and other ecology damages to the water bodies. Oil is not soluble in the water-phase and the nature of the oil-phase in oily wastewater is different from one case to another. Oils and greases by definition, are not soluble in water. The effluent has the oil and grease present in the form of micro droplets or tiny suspended particles if the concentrations are low. Higher levels of the analytes in the sample commonly appear as an actual layer on top of the water. The term free product "is often used to describe this condition, especially when petroleum hydrocarbons are present. The layer can range from floating semi-solid chunks of grease to gasoline-like sheen on the surface. Although we most commonly associate oils and greases with materials floating on the top of the water column, this is not always the case. There are oils and greases that are heavier than water and will settle to the bottom of the container. Dense oils and greases are frequently composed of halogenated solvents and other materials.

II. METHODS AVAILABLE FOR TREATMENTS OF AUTOMOBILE SERVICE CENTRE WASTE WATER

- 1) Absorption
- 2) Adsorption
- 3) Chemical and biological method
- 4) Physical method
- 5) Mechanical method

Among this adsorption method is used for removal of oil and grease

III. ADSORPTION METHOD

The word "adsorption" was determined in 1881 by German physicist Heinrich Kayser. It is adhesion of atom or molecule of from a gas liquid or dissolved solid to a surface. This process creates a film of the adsorbate on the surface of the adsorbent, this process differs from absorption, in which a fluid (the absorbate) permeates or is dissolved by a liquid or solid (the adsorbent). Adsorption is a surface based process. Similar to surface tension, adsorption is a consequence of surface energy. Adsorption is present in much natural physical biological and chemical system and is widely used in industrial application. Adsorption is a surface phenomenon with common mechanism for organic and inorganic pollutants removal. When a solution containing

absorbable solute comes into contact with a solid with a highly porous surface structure, liquid–solid intermolecular forces of attraction cause some of the solute molecules from the solution to be concentrated or deposited at the solid surface. The solute retained (on the solid surface) in adsorption processes is called adsorbate, whereas, the solid on which it is retained is called as an adsorbent. This surface accumulation of adsorbate on adsorbent is called adsorption. This creation of an adsorbed phase having a composition different from that of the bulk fluid phase forms the basis of separation by adsorption technology O&G layer reduces biological activity of treatment process. Where oil film formed around microbes in suspended matter and water. This lead to decrease dissolved oxygen levels in the water. To avoid the clogging of various unit processes in ETP, the skimming tank is provided for the removal of oil and grease, but the skimming tank has high maintains cost. oil-water mixture with droplets size ranging treatment plants but the main disadvantage of these methods is their low efficiency of removal .The remaining oil causes clogging of pipes in treatment units that need cleaning and sometimes replacement of pipes .This lead to increase maintenance and inspection cost Recently, alternative uses of biochemical route (enzymes and lipases) have potentially gained more attention due to their Clean and friendly application and to overcome limitation. Microbial activity plays significant role in performance, strength purification process, and elimination of pretreatment process in wastewater treatment plant depending on enzyme costs.

To solve these problem oil and grease is removed at source itself by using adsorbent material i e corn cobs. Thus use of corn cobs as bio adsorbate is economical as compared to skimming tank

IV. PROBLEM STATEMENT

O&G layer reduces biological activity of treatment process. Where oil film formed around microbes in suspended matter . This lead to decrease dissolved oxygen levels in the water. To avoid the clogging of various unit processes in ETP, the skimming tank is provided for the removal of oil and grease, but the skimming tank has high maintains cost.

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V. SOLUTION MATERIAL

A. Corn Cobs

Corn cobs are a lingo cellulosic material composed of cellulose, hemicellulose and lignin. These polymeric fibers consist of monomeric molecules. Cellulose is built of C6sugars; hemicellulose mainly of the C5 sugars xylose and arabinose. Lignin consists of phenolic macromolecules Cobs, leaves and stalks are important residues of corn processing and consumption. For every 1 kg of dry corn grains produced, about 0.15 kg of cobs, 0.22kg of leaves and 0.50 kg of stalks are produced(So. This results the production of about 130.13, 190.85 and 433.76 million tons of cobs. The porosity results of the corn cobs, leaves and stalks are shown. The average porosity was 67.93, 86.06 and 58.71% for the corn cobs, leaves and stalks, respectively. Corn leaves have the highest porosity, because they have larger particles and the greatest average particle size than those of the cobs and stalks.

Capacity of corn cobs to adsorb oil and grease= 1gallon =3785lit

600cubic fit adsorbs 1000gallon

600cubic fit=16.99cubic mt.

VI. CONCLUSION

- 1) To remove oil and grease from the waste water laterite is used to by using various parameters such as length of channel, contact area, spacing of baffle.
- 2) The waste water is treated by using adsorption technic by using material corn cobs.

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