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Using DSFF Reactor Anaerobic Treatment of Sugar Industry Effluent

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Abstract *- The use of large amount of water and the production of organic compounds as liquid effluents are major environmental issue in sugar cane industry. Anaerobic digestion is the suitable option for the treatment of effluents. In the presence of biodegradable components in the effluents is advantage of anaerobic process over other treatment method. The aim is study of t sugar industry wastewater by DSFF Reactor. Thus DSFF reactor can be used for treating sugar wastewater and for producing biogas.*

Keywords: *Anaerobic digestion; Reactor; Effluents; Sugar*

1. INTRODUCTION

Industrial wastes are the one which known as industrial wastewater. Industrial wastes are either discharged directly into the canals or else are discharged into natural source of water. Industrial wastewaters are treated partially before their discharged into sewers. Or use special method to treat the waste water some industries as follows

1. *. Industry like sugar, canning, dairy, fermentation etc.*
2. *Industries like coke and gas, iron and steel, oil, petroleum etc.*
3. *Industries like chemicals industry, metals finishing, paper and pulp, rubber, tanning, textiles etc.*

2. MATERIALS AND METHODS

[A laboratory scale Downflow Anaerobic Reactor was fabricated from PVC pipe of 10.24cm internal diameter. The overall height of the reactor 121.29cm (48inches), one inlet at 17.78 cm (7inch) from the top of reactor was provided for the influent. The effluent outlet was provided at 17.78cm (7inch) from the below level of the reactor. Pieces of PVC pipe of 1.28 diameter (1/2 inch) roughened both inside & outside are used as the packing material in the reactor. Opening are provided at the top & bottom of the reactor to guide gas bubble into the separator to collect the gas generated and allow the setting of suspended of suspended solids respectively . The effluent tube was connected to the water seal to avoid the escape of gas through the effluent. The gas outlet connected to the measuring flask through aquarium pipe the measuring flask is full of water kept inverted in the bucket containing water, not flow was used for feeding the reactor. Exit valve of ½ inch size was fixed at the bottom, of the reactor to facilitate the sludge withdrawal. The lid of the reactor and the other fittings *were sealed to maintain anaerobic condition inside the reactor. The reactor was supported by mild steel framed structure.]8*

Fixed Film Reactor

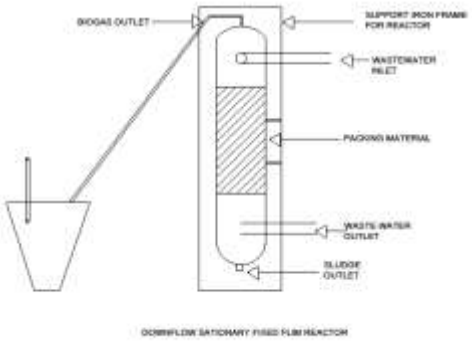
In SFFR structure include such as activated carbon, PVC

Fig. No. 1: DSFF Reactor

Anaerobic Downflow Stationary Fixed Film Reactor

Downflow Stationary Fixed Film (DSFF) reactor is member of family of high- rate anaerobic reactors; all are based on retention of the active biomass. The DSFF reactor distinguishes itself from other type of advanced reactors by the downflow mode of operation, the architecture of its packing (fixed biofilm support), and the absence of suspended growth.

The method of operation of DSFF reactors is shown in Fig



RESULTS

The reactor was started with an Hydraulic Flow Rate (HFR) 2.514mlper min at a constant hydraulic retention time (HRT) of 48 hrs. the study was conducted under ambient environmental conditions the HRT is change as we get state conditions At 24 hrs.HRT the HFR was increase to 5.147ml/ min an at 12hrs. HRT, ***HFR*** *was 10.29ml/min the reactor is operated till HRT of 12 hrs*

Initial Reading.

TEST	*READING*
Temp	*3.5*
PH	*7.4*
TDS	*2000mg/lit*
Connectivity	*5.70ms*
Alkalinity	*650mg/lit*
Acidit	*0mg/lit*
Biogas Production	*0mg/day*

Final Reading

TEST	*READING*
Temp	*3.5*
PH	*7.4*
TDS	*1900mg/lit*
Connectivity	*5.58ms*
Alkalinity	*600mg/lit*
Acidit	*0mg/lit*
Biogas Production	*10mg/day*

3. CONCLUSIONS

1. *Using Downflow anaerobic treatment sugar industry waste water we can treat effectively.*
2. *COD reduction is from 2000 mg/l to 250mg/l during treatment at the HRT point COD level is little bit increase.*
3. *The PH of waste water of sugar industry varies between 6.7 to 7.7 showing better performance of the reactor.*
4. *Generation of biogas gradually increase from 5.0ml/day to 1200.01ml/day during study period.*

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