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Analytical Chemistry: Comparison of waste water coming out from vegetable oil refinery plant and effluent treatment plant.

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Abstract: *The main source of edible oil are Soybean, Sunflower and Rice bran. The crude oil is then refined in order to remove free fatty acid and other triacyl glyceride. The refining of crude oil generates large amount of waste water. The use of H_2SO_4 generates highly acidic water with heavy load of organic matter, COD etc. This waste water is then treated in effluent treatment plant by physical and chemical process. The organic contamination decreases but hardness increases due to use of calcium chloride and alum. This also increases the chloride ion concentration hence the effluent coming out after secondary treatment is also unfit for reuse or recycle and further treatment is required before it is discharged or reused.*

Keywords: *Soybean, Rice Bran Oil, ETP, COD, BOD.*

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I. Introduction

The sources of edible oil are Soybean, Groundnut, Sunflower, Rice bran, Mustard oil etc. The manufacturing units of edible oil generates large amount of solid waste and waste water. The waste water coming out from edible oil refinery is highly polluted. The characteristic of waste water depends upon type of oil processed and method of extraction. Edible oil effluents are treated by primary, secondary and tertiary process. Biological treatment (tertiary treatment of waste water of edible oil refinery is activated sludge process and sequencing batch reactor[1] (Bux et al 2009). To study the quality of waste water from edible oil manufacturing unit and treated water from effluent treatment plant were studied[1]. It was found that waste water is high in COD even after treatment and needs further treatment.

II. Experiment

Waste water samples were collected from edible oil refinery of Rajnandgaon C.G. from manufacturing unit and then waste water coming out from effluent treatment plant in the month of August'17. These samples were analyzed for water quality parameters 2-4.

III. Results and Discussion

pH: The pH of the waste water coming out from plant was 1.8 to 2.0. It is highly acidic. After treatment in effluent treatment plant the pH was around 7.2 to 8 (permissible).

Total Suspended Solid:

Total suspended solid has high value for untreated waste. It decreases after treatment with Alum/Cacl2 in E.T.P.

Conductivity:

Conductivity of treated waste water increases after treatment due to increase in Ca^{2+} and Al^{3+}

Organic Matter:

ETP removes maximum amount of oil and grease.

Total Hardness:

Total hardness of water increases after treatment of waste water in ETP.

Decrease of COD: Waste water from manufacturing unit has high value of COD. After treatment waste water COD decreases upto 98%.

Removal of BOD:

Removal of heavy metal: Fe, Zn, Ca2+ are present in treated waste water.

IV. Conclusion

Further treatment of waste water is required for its reuse, recycle and make it portable for agriculture and public health.

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