PROJECT REPORT ON

Biofilters: An Emerging Technique

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SYNOPSIS

A biofilter is a batch depth filter comprising of simple bed of organic matter or living systems arranged in a series of layers used for the treatment of industrial effluent by capturing and biologically degrading the process pollutants. The present project is based on effluent purification using natural filtering materials. The primary objective was to study the properties of the effluent and to design a filter unit comprising of biological materials which could effectively treat the effluent. Four main filter materials: Sand, Coconut fibers, Water Hyacinth roots and immobilized *Pseudomonas aeruginosa* in Sodium Alginate Beads were screened and selected as the filter beds. Next step was to prepare a prototype of main unit. This was done using a glass syringe forming an analytical bed. This analytical bed gave an rough but useful information on the filtration ability of selected filtering media sand, coconut fibres, water hyacinth roots were pre processed and sodium alginate beads were prepared and incorporated into the syringe to form an analytical bed. Once the analytical bed was formed few analysis such as turbidity test, TDS, bacterial count and dye reduction were carried out. A biofilter unit was fabricated using the mentioned filter medium. The effluent was run down the unit and the efficacy of the designed biofilter was analyzed by checking the water quality before and after the filtration. Significant reduction in turbidity of the effluent was achieved, the color and odor dropped down. About 58-63% reduction in total dissolved solids was obtained. Significant reduction in the concentration of chlorobenzene was seen, when retained in the filter unit for varying intervals of time. Even the bacterial count of the effluent after filtration was reduced. The filter unit was able to trap chemical compounds such as dyes as well. The biofilter is economically feasible.