

Optimisation of Wastewater Treatment for Yeast Processing Effluent Using Response Surface Methodology

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Abstract : In the present study, the interactive effects of temperature and cultured bacteria on the performance of a biological treatment system of yeast processing wastewater were investigated. The main objective of this study was to investigate and optimize the operating parameters that reduce organic load and colour. Experiments were conducted based on a Central Composite Design (CCD) and analysed using Response Surface Methodology (RSM). Three dependent parameters were either directly measured or calculated as response. These parameters were total Chemical Oxygen Demand (COD) removal, colour reduction and total solids. COD removal efficiency of 26 % and decolourization efficiency of 44 % were recorded for the wastewater treatment. The optimized conditions for the biological treatment were found to be at 20 g/l cultured bacteria and 25 °C for COD reduction. For colour reduction optimum conditions were temperature of 30.35°C and bacterial formulation of 20g/l. Biological treatment of baker's yeast processing effluent is a suitable process for the removal of organic load and colour from wastewater, especially when the operating parameters are optimized.

Keywords : COD reduction, optimisation, response surface methodology, yeast processing wastewater

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