

Optimization of Bioremediation Process to Remove Hexavalent Chromium from Tannery Effluent

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Abstract : The removal of toxic and heavy metal contaminants from wastewater streams and industrial effluents is one of the most important environmental issues being faced world over. In the present study three bacterial cultures tolerating high concentrations of chromium were isolated from the soil and wastewater sample collected from the tanneries located in Warangal, Telangana state. The bacterial species were identified as Bacillus sp., Staphylococcus sp. and pseudomonas sp. Preliminary studies were carried out with the three bacterial species at various operating parameters such as pH and temperature. The results indicate that pseudomonas sp. is the efficient one in the uptake of Cr(VI). Further, detailed investigation of Pseudomonas sp. have been carried out to determine the efficiency of removal of Cr(VI). The various parameters influencing the biosorption of Cr(VI) such as pH, temperature, initial chromium concentration, inoculum size and incubation time have been studied. Response Surface Methodology (RSM) was applied to optimize the removal of Cr(VI). Maximum Cr(VI) removal was found to be 85.72% Cr(VI) at pH 7, temperature 35 °C, initial concentration 67mg/l, inoculum size 9 %(v/v) and time 60 hrs.

Keywords : Staphylococcus sp, chromium, RSM, optimization, Cr(IV)

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