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BIODEGRADATION OF ATRAZINE BY FREE AND IMMOBILIZED CELLS OF *Arthrobacter* sp. STRAIN DNS10

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Abstract

The main purpose of this research was to study the ability of *Arthrobacter* sp. to biodegrade atrazine, as free and immobilized cells of the strain DNS10 under several important environmental factors, such as temperature, pH, salinity, substrate concentration. Furthermore, this paper objective was also to assess the process considering the immobilization under extreme conditions, such as high salinity and high atrazine concentration. DNS10 was immobilized on a sodium alginate gel matrix. At a 1% inoculation in the medium, DNS10 exhibited a removal ratio of 99.67% of a 100 mg L⁻¹ of atrazine during 36 h. At optimal conditions such as 30°C and pH 7.0, both free and immobilized cells showed their maximum removal ratios. DNS10 performed at its best to remove atrazine when the salinity concentration was 1%. Under tougher conditions, including high salinity and high atrazine concentrations, the immobilized cells were more efficient in atrazine degradation than the free cells. Moreover, immobilizing cells predisposed bacteria over negative effects of changes with both temperature and pH. This research indicated the advantages of immobilization and that the immobilized materials could preserve the efficiency of bacteria for biodegradation.

Key words: Atrazine, *Arthrobacter* sp. DNS10, biodegradation, free cells, immobilized cells

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