Biodegradation of Naphthalene by Free and Alginate Entrapped *Pseudomonas* sp.

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Naphthalene degradation by freely suspended and immobilized cells of *Pseudomonas* sp. isolated from contaminated effluents has been investigated in batch cultures and continuously in a packed bed reactor. Naphthalene concentration was varied from 25 mM to 75 mM, the temperature (30 °C) and pH (7.0) were kept constant. The results showed good acclimation of the strain to carbon source and degradation rate was highly affected by initial concentration. Alginate-entrapped cells have given good yields although initial rates were not as high as those encountered with free cells. A first order exponential decay kinetic model was proposed with values of parameters for each initial concentration. A laboratory scale packed-bed bioreactor was designed using parameters calculated above and continuous experiments were realized at different flow rates (100 to 200 ml/h), with different feed concentrations and operating during 30 days. The conversion at low feed concentrations and low flow rates was complete whereas at high flow rates and high concentrations it was less efficient because of diffusional limitations and short residence time.

Key words: Naphthalene, Biodegradation, Bioreactor