

Investigation of Biosurfactants Production from Petroleum Oil Wastes Using Response Surface Methodology

دراسة إنتاج المواد الخافضة للتوتر السطحي من نفايات الزيوت البترولية باستخدام منهجية الاستجابة السطحية

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Abstract

This study reports rhamnolipid biosurfactant production from biodegradation of petroleum oil wastes using *Pseudomonas aeruginosa* ATCC 9027. Glycerol was added as an inducer to enhance the production of rhamnolipid. Tests were run on effluents with different initial oil concentrations (1, 1.5, and 2%) at two glycerol dosages (10 and 20% of the oil concentration in the effluent). A higher percentage removal of oil in the ensuing effluent (99.9% for both poly aromatic and poly aliphatic hydrocarbon fractions) was realized. Meanwhile, a high percentage yield of rhamnolipid (2.7 g/L) was observed. Optimization of the parameters affecting oil biodegradation; using the response surface methodology (RSM) and a Box- Behnken design, statistical analysis of the experimental data, was applied. The study showed that the optimum values for reaction time, crude oil percentage and glycerol addition were 240 h, 2 and 18.346%, respectively. These values were comparable to the values obtained from the experimental work.