



BIOREMEDIATION OF CRUDE OIL- CONTAMINATED TROPICAL SOIL IN BENCH-SCALE PILES

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Abstract

This work presents the results of a bench-scale study to evaluate the applicability of biopile to treat crude oil-contaminated Brazilian soils. Tests were carried out in 20-liter piles, using two different batches of soils artificially contaminated. First set of essays was performed with piles contaminated with paraffin crude oil with average TPH (total petroleum hydrocarbons) of 39,442 mg/kg. Rice hull, sawdust and coconut hard core were used as bulking additive at 10% by volume. After 16 weeks of treatment, the best TPH degradation percentages achieved was achieved using no bulking agent (69.13%). The addition of bulking material did not improve the TPH degradation. Pile turn frequency had no influence at the efficiency of TPH degradation due to the small scale used in the essays. Another test was carried out with a clayey soil (soil B). In this case, the rice hull amendment improved soil permeability and retained more easily the water. These results could be explained by the less equilibrated texture and poor fertility (micro and macro nutrients) of soil B. Higher frequency of pile mixing (each 7 days) had not shown any advantage to the contamination disappearing due to the small scale used in the essays. The results obtained demonstrate that clayey soils can be remediated to acceptable levels within a reasonable time.

Keywords: contaminated soil; biopile; crude oil; total petroleum hydrocarbons; biodegradation

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