Environmental Engineering and Management Journal, December 2006, Vol.6, No.6, 1325-1332
http://omicron.ch.tuiasi.ro/EEMJ/

"Gh. Asachi" Technical University of Iasi, Romania

EVALUATION OF BIOSTIMULATION, BIOAUGMENTATION AND USE OF BIOSURFACTANT AS TREATMENT TECHNIQUE OF CLAY SOIL CONTAMINATED WITH DIESEL OIL

Sandro J. Baptista[1*], Eliana F. S. Camporese[2], Denize D. C. Freire[1]

[1]*Environmental Technology Laboratory, Department of Biochemical Engineering, School of Chemistry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil,*
[2]*Petroleum Microbiology Laboratory, Department of Biochemical Engineering, School of Chemistry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil*

Abstract

The aim of the present work was to evaluate the use of biosurfactant (rhamnolipid) in the biodegradation of diesel oil in clay soils. The assays were held in with an aerobic fixed bed reactor with 400g of oil-contaminated soil, at room temperature and aeration rate of 3L/h. To evaluate the techniques of biostimulation, bioaugmentation and the use of biosurfactant in the removal of diesel oil, different conditions was evaluated. Total petroleum hydrocarbon (TPH) content was measured in order to monitor the diesel oil biodegradation and total heterotrophic (BHT) and hydrocarbon-degrading bacteria (BHc) were enumerated, in the beginning and at the end of 30 days of experiments. The TPH removal was above 50% when fertilizer and/or biosurfactant were used. The addition of fertilizer was the relevant factor in the improvement of biodegradation of diesel oil.

Keywords: bioremediation, bioestimulation, biosurfactant, clay soil

[*] Author to whom all correspondence should be addressed: Phone: +36 88 624 861, Fax: +36 88 624 533, e-mail: sjbaptista@hotmail.com