tant in limiting pH increase near the anode. The experimental cell has been redesigned to permit continuous measurement of pH, voltage drop, and electrical conductivity. Theoretical predictions will be compared with measured results.

Expanded-bed batch column studies are in progress. Soil contaminated with phenol is mixed with nutrients and acclimated biomass. The three soils under different environmental conditions of nutrients and biomass are maintained as expanded beds in glass columns using the recirculated biomass slurry and air in the case of aerobic systems . Degradation rates are monitored and compared with those observed in the batch studies.

Preliminary results indicate that the addition of acclimated biomass enhances degradation of phenolic compounds on contaminated soils. The acceleration of the removal of phenolic compounds is more pronounced when the acclimated biomass is applied to soils which exhibited little or no biological activity.

Enhanced bioremediation of contaminated soil using acclimated biomass

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Abstract

The objective of this research program is an evaluation of the effects of biomass, acclimated to specific phenolic compounds, on the accelerated bioremediation of organically contaminated soils in place. The removal rates of phenol, *p*-cresol and 2,4-dichlorophenol mixed with well characterized fine sandy loam soil were established under three different environmental conditions: soil, soil plus nutrients (nitrogen and phosphorus) and soil plus nutrients and acclimated biomass. Aerobic biomass was collected at a local wastewater treatment facility and was acclimated to the specific phenolic compound in batch reactors without soil, but with essential nutrients added. The results of this phase of the study indicate that the removal rates were zero order.

The effectiveness of acclimated biomass in accelerating the removal of the specific phenolic compound was investigated initially in batch studies followed

by continuous flow column systems. Varying amounts of a specific phenolic compound was added to ten grams of soil in 125-mL serum bottles. Each day the contents of a predetermined number of bottles were extracted with methylene chloride and the extract analyzed using liquid chromatography. The data indicate that the removal rates observed under all three environmental conditions were best described by zero order kinetics. The highest rate of degradation was 345 mg phenol/kg soil-day which was observed for the system which contained soil, nutrients and acclimated biomass. A removal rate of only 133 mg phenol/kg soil-day was observed for the system which contained soil and nutrients.

Expanded-bed batch column studies are in progress. Soil contaminated with phenol is mixed with nutrient and with nutrients and acclimated biomass. The three soils under different environmental conditions of nutrients and biomass are maintained as expanded beds in glass columns using the recirculated biomass slurry and air in the cas of aerobic systems . Degradation rates are monitored and compared with those observed in the batch studies.

Preliminary results indicate that the addition of acclimated biomass enhances degradation of phenolic compounds on contaminated soils. The acceleration of the removal of phenolic compounds is more pronounced when the acclimated biomass is applied to soils which exhibited little or no biological activity.

Enhancement of organic vapor incineration using hydrogen peroxide

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Abstract

Incineration of dilute mixtures of volatile organic compounds (VOCs) in air was studied in an externally heated quartz tube reactor. Dilute solutions of