B323 Simultaneous Removal of BTX Vapors by Biofiltration

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Benzene, toluene and xylene isomers(BTX) are major constituents of gasoline and serve also as important industrial solvents. For complete degradation of BTX, a defined mixed culture was constructed and all of the BTX components were simultaneously degraded as demonstrated by gas chromatographic analyses. We screened for an appropriate matrix to utilize for both cell immobilization and biofiltration, and peat-biofilter was turned out to be better than biofilters with either hydroball, vermiculite, or bark chips. When immobilized on a porous peat column, removal of all three BTX components was observed at the rate of 40~50 g $h^{-1}m^{-3}$ filter bed. Forty-five days after the start-up, the biofilter reached at steady state and we observed a sustained removal of all BTX components. A rationally formulated consortium consisting of members with complementary metabolic abilities was successful for the simultaneous treatment of BTX mixture and should be of use both in industrial emission control and in soil venting operations.

B324 Enrichment of Gasoline-Degrading Microorganisms and Its Application to Biofiltration

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The widespread use of gasoline has resulted in its introduction into soil and groundwaters from leaking tanks and spills. The purpose of this study was to enrich gasoline-degrading microorganisms and to apply for biofiltration to treat gasoline VOCs in contaminated air streams. A preliminary batch culture experiment from the soil sample showed that gasoline vapor was degraded 45~58% regardless of the sample origin based on the gas chromatographic analyses. The enriched consortium degraded 50ppm of benzene, toluene, ethylbenzene and xylene isomers(BTEX) within 2 hrs. Pentane and *n*-hexane were not degraded as much as BTEX. And MTBE and cyclohexane were not degraded at all during 50 hrs incubation. The biofilter was first operated at a gasoline flow rate 0.05ml/min for 13days with removal efficiencies estimated up to 80%. After the biofilter reached at steady-state, the gasoline flow rate was increased to 0.1ml/min and operated for 20 days. During this period, the removal efficiencies were estimated in the range of 50~72% and the maximum removal rate was $60g \cdot m^{-3} \cdot h^{-1}$. These results showed that biofiltration would be useful for clean up of the gasoline-polluted environments.