

B308 Biodegradation of BTX Compounds in a Biofiltration System under Anaerobic Condition

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Biofiltration of a water and gaseous stream contaminated with benzene, toluene, and *m*-xylene (BTX) compound was evaluated in this study. Continuous flow studies were done using 3.5 cm (i.d) × 38 cm (ℓ) glass columns containing 350 g of the sand medium. The experimental plan was therefore designed to investigate the long-term performance of a BTX-fed column with particular emphasis on the following parameters: (1) flow rate and BTX loading; (2) removal efficiency with biofilter under steady-state condition. The columns were operated in a inlet concentration range from approximately 250 to 410 μM. For saturated column, 21-day lag period was observed. By day 25, the overall removal efficiency had reached 60 %. At 29 days of operation, the overall removal efficiency had risen to 96%. Virtually 94 % (benzene 89 %, toluene 96 %, and *m*-xylene 97 %) of BTX were removed within the 30 to 70 days. For unsaturated column, of which approximately 65 % was removed. The saturated column degraded BTX more rapidly than the unsaturated column. In saturated column, the toxicity of BTX was decreased during the anaerobic degradation. This indicates the possibility of applying biofiltration to a broader range of more complex aromatics.

B309 Effect of Transition Metals and Moisture Contents on PCBs Dechlorination

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To enhance the reductive dechlorination of PCBs in anaerobic sediments, we examined the effect of moisture contents and transitional metals on Aroclor 1248 dechlorination. We added moisture to the vials which had 40% of moisture content and showed less dechlorinating activity than those of high moisture contents after a 48-week incubation. But, we could not detect any dechlorination and growth of dechlorinators, sulfate-reducers, and methanogens with any addition of moisture. The influence of transitional metals was investigated using Ni and Co which were the central metals of bacterial transition-metal coenzymes such as coenzyme F₄₃₀ and vitamin B₁₂, respectively. After a 21-week of incubation, the total chlorines per biphenyl decreased 3.88 to 3.47, irrespective of Ni and Co addition. In the vials adding 0.5 mM of Ni and Co, *para*-dechlorination was 2.3 times faster than *meta*-dechlorination, however, in the other conditions of vials, *para*-dechlorination was only 1.5 times faster than *meta*-dechlorination. Decrease of tetra- and penta-chlorobiphenyls (CBP) and concomitant increases of di- and tri-CBP were observed at all vials. The result of this study imply that chlorination pattern affected by mixtures of Ni and Co.