Addition of Rhodococcus fascians AC6 to prevent inhibition of the toluene degradation from ethyl acetate in biofiltration of VOCs-contaminated air stream.

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Abstract

Airlift bioreactor containing polyvinyl-alcohol-immobilized cell beads was investigated for its capability
of biodegradation of dimethyl sulfoxide (DMSO) in term of sludge characteristics including the strategy of
acclimation with sucrose and the protection of microorganism from poisoning of DMSO by PVA cell
beads. Media condition with sucrose at 50 mg L 1 was beneficial to the biodegradation of DMSO in the
fresh PVA entrapped-sludge, but became insignificant in the acclimated one as for tolerance of DMSO toxicity.
The removal efficiency of DMSO had the highest rate at 1.42-kg DMSO per kilogram of suspended
solid per day after series acclimation batches in the oxygen-enriched airlift bioreactor treated with the
1187.4 mg L 1 of DMSO. Microbial consortium was required for the complete biodegradation of DMSO
without any dimethyl sulfide produced. Pseudomonas sp. W1, excreting extracellular monooxygenase
identified by indole, was isolated to be one of the most effective DMSO-degrading microorganism in
our airlift bioreactor

Keyword：biofiltration, Rhodococcus fascians, Rhodococcus sp., ethyl acetate, toluene, biodegradtion