

Biodegradation of rhamnolipids in liquid cultures : effect of biosurfactant dissipation on diesel fuel/B20 blend biodegradation efficiency and bacterial community composition.

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Streszczenie

Bacterial utilization of rhamnolipids during biosurfactant-supplemented biodegradation of diesel and B20 (20% biodiesel and 80% diesel v/v) fuels was evaluated under conditions with full aeration or with nitrate and nitrite as electron acceptors. Rhamnolipid-induced changes in community dynamics were assessed by employing real-time PCR and the ddCt method for relative quantification. The experiments with rhamnolipids at 150 mg/l, approx. double critical micelle concentration (CMC) and diesel oil confirmed that rhamnolipids were readily degraded by a soil-isolated consortium of hydrocarbon degraders in all samples, under both aerobic and nitrate-reducing conditions. The presence of rhamnolipids increased the dissipation rates for B20 constituents under aerobic conditions, but did not influence the biodegradation rate of pure diesel. No effect was observed under nitrate-reducing conditions. The biodegradation of rhamnolipids did not favor the growth of any specific consortium member, which proved that the employed biosurfactant did not interfere with the microbial equilibrium during diesel/biodiesel biodegradation.

Słowa kluczowe

Biodegradation, Biodiesel, Diesel, Nitrate-reducing conditions, Rhamnolipids

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