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Bioredemiation of Diesel Oil Contaminated Water after the Ultrasound Treatment of Oil-contaminated Soils

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Diesel fuel contains a dominating part of n-alcanes with a chain length of 15 to 25 carbon atoms, a higher number of branched iso-alcanes and many aromatic molecules. On its way from the oil spring to its end user the mineral oil is transported a long way and maybe stored for a long time. This is the reason why the contamination of water and soil is a widespread environmental problem nowadays. Because of its toxic effect the mineral oil reduces the diversity of species in the contaminated areas. Therefore it is absolutely important to reduce to the pollution of mineral oil in the nature to a minimum.

The ultrasonic treatment of soils is a mechanical procedure to remove mineral oil contaminations. During its application, the contaminants move from the soil into water and are pumped out of the soil. The effluent is highly contaminated with mineral oil. The aim of the experiments was to examine the possibility to remove the mineral oil contamination form the water phase with biological methods. Therefore different microorganisms were tested on their degradation rates. A purchased microorganism mixture was compared to other microorganisms found in screening processes. Different media conditions were tested to increase the degradation of the mineral oil in the water phase. Bioreactor experiments were done and compared to shaking flask experiments. Diesel was used as the mineral oil source.

Bioremediation processes help to clean the soil in a natural way. Contaminations are cleaned without producing new contaminations. These processes protect the soil and its population and are a good option to the mechanical processes.