Implementation of a Biosurfactant-Enhanced Treatment for Soils Impacted by PAH

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The low solubility of PAH molecules limits biodegradation remediation techniques related to PAHs contaminated soils because of low bioavailability. Using a biosurfactant is a promising way when considering their biodegradability and also has better biocompatibility with degrading bacteria than chemical surfactant.

The first step of our research focuses on the biosurfactant production optimization at the laboratory scale. The optimal balance parameters have been selected to improve bacterial growth: carbon sources, nutrients, oxygen supply and temperature. PAH biodegradation trials were performed with contaminated water and contaminated soil samples. Several bacteria strains, nutrient injection techniques, and balances were achieved.

The first set of experiments revealed that the carbon source and the C/N ratio are the key parameters that influence biosurfactant production. Biodegradation trials have already proved the high potential of bacterial strains for their ability to produce biosurfactant which pushes the PAHs up to the micellar state.

During the final step of this work, those laboratory trials will be extended to an in situ pilot treatment on an industrial site.