

## Assessment of VOCs Bioremediation Considering Microbial Inhabitation and Soil Environmental Factors

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Volatile organic compounds (VOCs) like tetrachloroethene (PCE) and trichloroethene (TCE) spread throughout the fields in Japan, which causes significant problem of soil and water pollution. PCE and TCE are biotic or abiotic decomposable pollutant. In recent years, bioremediation, purification method utilizing microbial metabolism, has become a remarkable technique due to its low-cost and environmental friendly points.

PCE and TCE can be entirely decomposed to ethen only by *Dehalococcoides*, through dichloroethene (DCE) and vinyl chloride (VC); *Dehalococcoides* is key microbes for the bioremediation. Inhabitation of *Dehalococcoides* in polluted sites is essential for in-situ bioremediation, especially biostimulation, while the distribution of the microbes and the environmental factors constraining microbial activities have not been elucidated.

To investigate the *Dehalococcoides* inhabitation and environmental factors like soil organic carbon, undisturbed cores including sandy and clayey soils were taken from several polluted sites. The cores were divided by soil texture, and the microbes and the factor items in the divided samples were analyzed.

The factor items were categorized into some groups related to anaerobic conditions, energy source, nutrients, osmotic pressure, and so forth. As an example, soil organic carbon was considered to affect appropriate anaerobic conditions, energy source, and nutrients during reductive bioremediation. The feasibility of the bioremediation was assessed based on a series of experimental data and considerable affecting items.

Keywords: VOCs, *Dehalococcoides*, Bioremediation, Environmental factor, Soil organic carbon