

AGE003-P07

会場:コンベンションホール

時間:5月27日 10:30-13:00

## 動電学的手法を利用した難透水性 VOCs 汚染地盤の浄化促進技術 Application of Electrokinetics to Enhance the Degradation of VOCs in Low Permeability Geological Formations

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Remediation of groundwater and soils polluted by VOCs, like PCE and TCE, with low cost and low energy remains a big challenge in the field of environmental engineering science. Although many kinds of technologies that are available, in principle, for treating VOCs, in situ remediation of them in low permeability geological formations, like clay and slit, is very difficult and generally suffers from incomplete remediation due to the complexity of hydro-geological conditions, the lack of effective microbes that can contribute to biodegradation, and/or low bioavailability of contaminants to microbes.

In this presentation, we compare and discuss the major technologies that are applicable to degradation or remediation of VOCs, summarize the difficulties and limitations associated with remediation of contaminants in low permeability geological formations and finally discuss the potentialities of using electrokinetics to enhance the degradation of VOCs in low permeability geological formations.

Potential application of electrokinetics to enhance the degradation of VOCs includes sequential reduction and oxidation reactions by using electro-activated water or electro-chemically activated water solution; spreading chemical solutions throughout a polluted formation by electro-osmosis flow for direct redox reactions; spreading nutrients and/or electron donors throughout a polluted formation by electro-osmosis flow for accelerating bioremediation; and combination of electro-osmosis flow with reactive barriers or pumping and treat approach. Some typical examples are collected and discussed to illustrate the efficiency of using the electrokinetic technology for accelerating in situ remediation of VOCs in low permeability geological formations.

Keywords: VOCs, Remediation, Degradation, Electrokinetics, Enhancement