

# Stability and Performance Enhancements of Electrokinetic-Fenton Soil Remediation

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## ABSTRACT

Electrokinetic process is a potential *in situ* soil remediation process which transports the contaminants via electromigration and electroosmosis. For organic compounds contaminated soil, Fenton's reagent is utilized as a flushing agent in electrokinetic process (Electrokinetic-Fenton) so that removal of organic contaminants could be achieved by *in situ* oxidation/destruction. However, this process is not applied widely in industries as the stability issue for Fenton's reagent is the main drawback. The aim of this mini review is to summarize the developments of Electrokinetic-Fenton process on enhancing the stability of Fenton's reagent and process efficiency in past decades. Generally, the enhancements are conducted via four paths: i) chemical stabilization to delay H<sub>2</sub>O<sub>2</sub> decomposition, ii) increase of oxidant availability by monitoring injection method for Fenton's reagent, iii) electrodes operation and iron catalysts and iv) operating conditions such as voltage gradient, electrolytes and H<sub>2</sub>O<sub>2</sub> concentration. In addition, the types of soils and contaminants are also showing significant effect as the soil with low acid buffering capacity, adequate iron concentration, low organic matter content and low aromatic ring organic contaminants generally gives better efficiency.

**Keywords:** Electrokinetic-Fenton, H<sub>2</sub>O<sub>2</sub> stability enhancement, Chemical stabilization, Oxidant delivery, Electrodes operation and Iron catalysts