



Sol-Actif bio-remédiation through bio-stimulation.

In recent years interest has grown in using slow release electron donors in enhanced bioremediation systems for treating chlorinated solvents in groundwater. This interest is largely derived from the simplicity and low maintenance requirement of slow release systems relative to conventional systems that use continuous or semi continuous addition of soluble electron donors like lactate or molasses.

There is now considerable interest in using slow release electron donors in place of conventional enhanced bioremediation systems that utilize soluble electron donors such as lactate or molasses. In conventional systems the majority of the total system cost is associated with labor and engineering of the donor delivery system, this is not the case for slow release systems, where labor and engineering costs are substantially reduced due to the one-time emplacement of the donor.

Several laboratory microcosm studies of reductive dehalogenation where **Sol-Actif®** has been compared to a variety of electron donors, including lactate, molasses and soybean oil. In each case **Sol-Actif®** was equal or more effective at promoting complete dehalogenation of TCE or PCE to ethene than the other donors

Examples of results of selected studies.

1) Comparison of TCE dehalogenation in vitro

Donor	Time to initial dehalogenation (days)	Time to complete dehalogenation (days)	Méthane formed ?
Sol-Actif	35	105	Oui
Cellulose	56	385	Oui
Polycaprolactone	133	160	Non
Coconut Oil	188	≥ 435	Non
Poly lactide glycolide	258	300	minimum
Peanut Oil	258	≥ 435	minimum
Corn Oil	≥ 435	≥ 435	minimum
Sodium lactate	56	≥ 258	Oui

2) Comparison on isolated spot in situ

Donor	Time to complete dehalogenation (days)	Residual VOC pollution at 270 days
Lactate	≥ 270	0.68 - 0.74
Molasses	≥ 270	0.54 - 0.78
Sol-Actif	120-190	0
Huile de soja	≥ 270	0,46 - 1

Potential use of Sol-Actif as agent of Biostimulation.

Dépollution in Situ : In Situ, **Sol-Actif®** is the more efficient slow release lectron donor kwnown today and can achieve in a few weeks what has not been achieved naturally in numerous years.

Dépollution of water on depollution bed : Addition of **Sol-Actif®** to a substrat (soil) enable to reduce size of depolluting installation thus reducing building and maintenance cost.

Combining Bioremédiation and Biostimulation.

Sol-Actif® can be utilised at promoting development of selected micro-organisms.

As an exemple it was demonstrated that **Sol-Actif®** enhance activity of micro-organisms such as *Bacillus* (*Subtillis*, *Liquefaciens*, *Fluorescens*, *Licheniformis*), *Trichoderma* (*Harzinium*, *Gliocladium*, *Virens*), *Paenibacillus*, *Streptomyces*, *Thiobacillus*. Combining both gives a result much greater than the simple addition of each effect individually.

To check if a specie can benefit from **Sol-Actif®** addition, it is better to use the following method than pietri box.

The test can be performed in sterile (i.e 120 ml) serum bottles. In each case soil is weighed (50 grams) out and dispensed into each bottle then filled with (75 ml) of non-sterile, filtered ground water. **Sol-Actif®** is added only at the beginning of the test at 1% rate, yeast extract (30 mg/l) are added to all amended bottles at the beginning of the test, using a gas tight syringe. Bioaugmentation of microcosms is made with organisms to test. After all the additions are completed, bottles are capped and left upside down in dark at room temperature.