Product Sheet

EHC® PLUS

PROVEN POWER OF EHC® REAGENT PLUS ACTIVATED CARBON

EHC® PLUS is a combination of EHC® REAGENT plus powdered activated carbon (PAC). This combined remedy approach can be used for the treatment of groundwater and saturated soil impacted by persistent halogenated compounds, including chlorinated solvents, pesticides, and organic explosives. EHC® PLUS is a synergistic mixture that stimulates both abiotic and biotic de-chlorination mechanisms and provides an adsorption pathway to help to achieve low remedial goals for difficult to treat contaminants.

KEY BENEFITS

- Multiple and dynamic reaction pathways → abiotic, biotic, and adsorption
- Abiotic and biotic pathways destroy contaminants including those with lower adsorption affinity for activated carbon, such as vinyl chloride, chloroethanes, and dichloroethanes
- Synergistic organic carbon and ZVI mixture creates a reactive halo in the Downgradient Zone by the volatile fatty acids and soluble iron corrosion products
- Solid PAC stays in the Injection Zone and does not migrate with groundwater flow cutting off contaminant plumes and helping to achieve low remedial goals

THE SOUND SCIENCE OF EHC® PLUS

Following an application of EHC® PLUS, the PAC results in an immediate reduction in aqueous concentrations of contaminants via adsorption and allows time for EHC® PLUS to create strong reducing conditions via biotic and abiotic mechanisms. This creates a powerful two-step treatment process and allows time for reductive treatment to be established.

As the bacteria ferment the organic component of EHC® PLUS, a variety of volatile fatty acids (VFAs) diffuse into the groundwater to serve as electron donors while corroding iron is released into the groundwater forming ferric and ferrous precipitates.

In addition, the PAC can serve as media to support both abiotic and biotic reactions on its surface with CVOCs (Nath and Bhakhar, 2011, Gamal et al., 2018, Aktas, Tang et al. 2011 and Cecen, 2007)

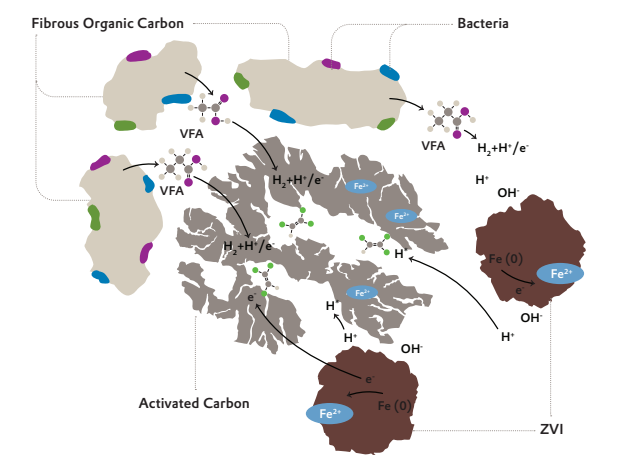

Figure 1 Mechanisms of reductive dechlorination of trichloroethylene adsorbed in the micropores of activated carbon. Activated carbon serves as the conductor for electrons and/or atomic hydrogen. H* represents adsorbed atomic hydrogen.

EHC® PLUS APPLICATIONS

- Permeable Reactive Barriers (PRBs) for Plume Control: EHC® PLUS has an estimated lifetime of 5 to 10 years in the subsurface which makes it ideal for placement into PRBs to promote CVOC removal under flow-through conditions.
- Source Areas: EHC® PLUS can also be used for hot-spot treatment and the product's adsorptive capability and longevity allows for continued treatment of contaminants as they slowly back diffuse from the solid matrix to groundwater at sites with high concentrations of sorbed mass/NAPL.
- Plume Treatment: A remedial design with multiple injection areas or reactive zone provides cost effective treatment approach for large dilute plumes.

INSTALLATION METHODS

- Injection of slurry via direct push technology (DPT)
- Hydraulic or Pneumatic Fracturing (applied to fine-grain formations including weathered and fractured bedrock)
- Direct placement into open excavations or trench PRBs
- Deep soil mixing

For more information and detailed case studies, please visit our website.

REFERENCES

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