

## KLOZUR® ONE: ALL-IN-ONE ACTIVATED PERSULFATE SYSTEM

**KLOZUR® ONE** is a blend of KLOZUR® SP and carefully selected, completely soluble activator reagents that can be injected to treat highly contaminated source areas and plumes. KLOZUR® ONE delivers activated persulfate chemistry more conveniently than ever before.

### KEY BENEFITS

KLOZUR® ONE delivers the power and stability of activated KLOZUR® persulfate along with selected activator reagents in an all-in-one product. KLOZUR® ONE is fully soluble which increases the ability to successfully distribute activated persulfate in the subsurface. KLOZUR® ONE includes multiple activation reagents creating a series of activation pathways for treatment of recalcitrant contaminants. These activators include both chelated iron and trace levels of permanganate, imparting a distinctive pink/purple color to KLOZUR® ONE. KLOZUR® ONE's chemistry has been carefully tested to show effective treatment of many common contaminants of concern (COCs) while having the necessary stability to be stored, batched, handled, and transported with the same hazard classification as KLOZUR® SP.

Combining the activator and KLOZUR® SP in the same product allows KLOZUR® ONE to deliver the performance of activated KLOZUR® SP in a more streamlined and simplified product. With KLOZUR® ONE, field contractors can mobilize a single tank and injection system making field applications easier and more cost effective.

#### KEY BENEFITS

Combined Activator and KLOZUR® SP in a single product

Multiple activation pathways

Completely soluble; distribution of activation chemistry in the subsurface

Trace permanganate provides visual indicator



## THE SOUND SCIENCE OF KLOZUR® ACTIVATED PERSULFATE

KLOZUR® activated persulfate has a long history of documented success having been used at thousands of sites around the world. These applications have been documented in hundreds of peer-reviewed journal articles and conference presentations. Furthermore, site and laboratory data proves effective treatment of some of the most recalcitrant compounds and emerging contaminants.

KLOZUR® ONE is activated using Evonik's patented technologies<sup>1</sup> to form powerful radicals capable of treating most common COCs. The highly soluble sodium persulfate in KLOZUR® ONE dissolves to form the persulfate anion which can persist for weeks to months after an application. While in the subsurface, the persulfate anion is activated by the chemistries built into KLOZUR® ONE to form sulfate and hydroxyl radicals ( $\text{SO}_4^{\cdot -}$  and  $\text{OH}^{\cdot}$ ). These oxidative radical species are kinetically aggressive and are among the most powerful oxidants known.

This oxidative radical pathway has been proven to destroy recalcitrant compounds including chlorinated ethenes (TCE, PCE, DCE and vinyl chloride), BTEX (benzene, toluene, ethylbenzenes and xylenes), polyaromatic hydrocarbons (PAHs), petroleum hydrocarbons (TPHs, GRO, DRO), 1,4-dioxane and pesticides among many other COCs.

## APPLICATIONS METHODS

- Injection through constructed wells or direct push technology (DPT) rods
- Soil mixing or blending
- Amended to the base or fill for an excavation

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

Notes: <sup>1</sup> Patents including US 6,019,548 and US 7,473,372

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