



Environmental Solutions

Procedure for Activating Klozur® Persulfate with Dissolvine® Iron-EDTA

Background

Klozur® Persulfate can be activated with Dissolvine® iron – EDTA (chelated iron) for the oxidative destruction of organic contaminants of concern, including PCE, TCE, DCE, vinyl chloride, BTEX, low molecular weight aromatic hydrocarbons, methyl-*tert*-butyl ether (MTBE), 1,4-dioxane and others.

For the iron – EDTA (FeEDTA) activation of Klozur Persulfate, the iron concentration in the groundwater needs to be maintained between 150 mg / L (ppm) and 600 mg / L (ppm). Iron concentrations below 150 ppm will result in kinetics that may not be favorable for the oxidation of various contaminants, and concentrations in excess of 600 ppm may lead to increased persulfate auto-decomposition. Dissolvine Iron – EDTA is 13% iron by weight, thus requiring between 1,154 ppm and 4,615 ppm FeEDTA to maintain the desired groundwater iron concentrations.

FMC recommends the addition of FeEDTA as an activator when iron activation is selected, even if there is iron already present in the sub-surface. Measured iron concentrations present in soils may not be available for persulfate activation or the iron may not be distributed evenly enough through the treatment zone to insure adequate activation of the persulfate.

Safety and Handling

Dissolvine FeEDTA is a yellowish-green powder with slight health hazards. Appropriate Personal Protective Equipment (PPE), including chemical goggles is required when handling this product. **Review the MSDS with all workers prior to handling this chemical.**

FMC does not recommend combining FeEDTA with persulfate in the same batching tank, as persulfate decomposition may occur with subsequent generation of heat and oxidant loss.

Procedure for determining the amount of FeEDTA needed:

1. Determine the volume of groundwater to be treated with Fe-EDTA activated persulfate.
2. The minimum amount of FeEDTA needed to achieve 150 ppm of Fe in the groundwater can be determined by:

$$\text{Lbs FeEDTA} = \# \text{ gallons of groundwater} * 150 * 6.38 \times 10^{-5}$$



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Applying Klozur persulfate solution and FeEDTA activator to a contaminated site

Various combinations of Klozur persulfate and FeEDTA in solution may undergo an exothermic reaction, potentially leading to significant heat generation (with temperature increases to 100 C possible) and oxidant loss. As a result:

FMC does not recommend combining FeEDTA with persulfate in the same batching tank.

Instead, it is recommended that separate batch tanks be utilized to make up the persulfate solution and the FeEDTA solution. The solutions may then be mixed prior to the well-head and co-injected or injected separately in a serial fashion.

At room temperature, FeEDTA is soluble at a concentration of 0.75 lb / gallon.