In-situ chemical oxidation has been applied in several cases for the remediation of contaminated sites. Activated persulfate is an innovative oxidant that constitutes an alternative to the most commonly used oxidants such as permanganate, ozone and Fenton’s reagent. In this work, we investigated the efficiency of activated persulfate oxidation against MTBE, Trichloroethylene (TCE) and 1,1,1-Trichloroethane (TCA) in both aqueous and soil-water systems using heat and ferrous ion as activators. Heat-activated persulfate oxidation at 40°C was the most effective method and achieved 98.6% removal of MTBE, and 89.9% of TCE in the soil-water systems within 24 hours. Considerable TCA removal was only observed in the aqueous systems. Iron-activated persulfate was very effective in the first hours but its efficiency was thereafter limited. Further experiments with MTBE and the use of complexing agents for improving/controlling iron availability did not increase the efficiency. In conclusion, the use of heat-activated persulfate seems most promising, and in addition, the increased aquifer temperatures may be beneficial to subsequent microbial degradation processes.

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